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THE UNIVERSITY OF ALBERTA

WORD MEANING AS EXPRESSED ORALLY BY ELEMENTARY SCHOOL CHILDREN

by

© KENNETH DONALD NIXON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY

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EDMONTON, ALBERTA

SPRING, 1975

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "Word Meaning as Expressed Orally by Elementary School Children" submitted by Kenneth Donald Nixon in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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External Examiner

Date Mar. 3, 1975

ABSTRACT

The purpose of this study was to explore the nature of word meaning as expressed orally by elementary school children of different ages.

The commonality and variability of word meaning expressed orally by children of ages six, seven, nine, and eleven years were examined. Each age group consisted of sixteen Ss (subjects) who rated between 100 and 115 on an intelligence test. Eight Ss responded as individuals; another eight Ss responded in groups of four each.

The investigator designed four tasks, each consisting of several stimuli. The first three tasks (verbal stimuli, real and/or vicarious experiences, and visual representations) were constructed to elicit the Ss' responses to a total of eighteen stimuli. The stimuli within each task varied on the concrete to abstract continuum. During the tape-recorded interviews, the Ss were asked to tell all they could about each stimulus. In the fourth task, the Ss were asked to respond to a specific series of questions and commands, each related to a particular category of meaning.

The Ss' responses were analyzed according to nineteen categories of meaning established on the basis of the research literature and the pilot study. The analysis

focussed generally on the number of criterial properties, the number of categories of meaning, and the quality of the word meaning expressed by the Ss in specific words, phrases, or sentences.

Certain characteristics of word meaning and the means of expressing word meaning were revealed in the responses of the Ss at each age level. The six-year-old Ss responded verbally to all stimuli with concrete referents. An increasing number of these Ss did not respond as referents became more abstract. Implicit meaning often was revealed in single words or through action. The seven-year-old Ss used additional categories of meaning and some class names. Occasionally their meanings were expressed in imprecise phrases. The nine-year-old Ss also used imprecise phrases but occasionally employed precise labels. Immediate experiences appeared to increase their quantity of meaning. The eleven-year-old Ss continued to refine labels, often in abstract terms, and generally produced larger quantity of meanings for verbal stimuli than did the other age groups.

Growth in word meaning across the age levels was revealed in an increasing number of multiple meanings, labels for criterial properties, and different categories of meaning. The middle years, ages seven and nine, appeared to be a period of testing imprecise expressions and a broad range of words to express meaning.

The different tasks produced different results. The Ss' responses to verbal stimuli revealed a steady growth in quality and quantity of word meaning from the younger to the older age levels. Provision of some type of experience in the other tasks resulted in an earlier completion of a pattern of word meaning in some instances.

Overall, patterns of growth in word meaning for the Ss in this exploratory study appeared to be influenced by the nature of the stimulus, the nature of the task, and the chronological age of the Ss.

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Almost a half century ago, Dewey spoke of the importance of words in evoking meaning and in the growth of intelligence.

> Even if the thing is not there to represent the meaning, the word may be produced so as to evoke the meaning. Since intellectual life depends on a store of meanings the importance of language as a tool of preserving meanings cannot be overstated (Dewey, 1933, p. 234).

The importance of words is reflected in a number of vocabulary studies which were reported over the years. Prior to the 1950's, these studies centred mainly on a quantitative indexing of vocabulary items. However, with the reports of Feifel and Lorge (1950) and Russell (1954), there was a change in focus to the examination of quality as well as quantity of word meaning. A growing body of research at the University of Alberta has been adding to the knowledge of children's word meaning: relationship of word meaning to other areas (Grant, 1965 and 1972; Jackson, 1968); development of instruments to measure quality of meaning (Evanechko, 1970; Siemens, 1973); ways of arriving at word meaning in context (Laing, 1974); and application to instruction (Payne, 1972). However, further information regarding children's growth

in language power and effective instrumentation for assessing the child's language competence are needed (Siemens, 1973, p. 3).

Menyuk (1971) suggested a weakness in early studies and a direction further research might take.

> Like increases in mean length of response, size of vocabulary is merely a surface measure of what is occurring in linguistic development. We would like to determine the direction these changes take, or in other terms, the meaning lexical items have at various stages of development (p. 171).

The mode for finding the meaning lexical items have for the child and the directions these changes take "will naturally be looked for in his conversation (Watts, 1944, p. 68)."

The present study arose from an examination of psycholinguistic and philosophical theories related to the thought component of meaning and the expression of meaning in the oral language of elementary school children. These theories were basic to the formation of a plan for extending the current knowledge of change in word meaning.

I. PURPOSE OF THE STUDY

The study was designed to explore word meaning as expressed in the oral language of elementary school children of different ages. A search for answers to the following questions comprised the major focus of the study:

1. What are the characteristics of word meaning

as revealed in the oral language of elementary school children of different ages?

2. Do the characteristics of word meaning differ for each of four groups: children of ages six, seven, nine, and eleven years?
3. What is the nature of these differences?

II. DEFINITION OF TERMS

For the purpose of this study, the meanings ascribed to certain terms were as follows:

Word meaning. A generalization resulting from recognition of the inherent properties of a group or a class of objects.

Criterial properties. Critical cues used as the basis for determining category membership (e.g., small, big, large).

Category of meaning. A cluster of criterial properties associated with a particular characteristic (e.g., category of size including the criterial properties of small, big, large).

Explicitness. The child's ability to communicate an idea through the direct use of precise words and sentences.

Average language user. A child who is rated by his language arts teacher as average in achievement in oral language.

III. RESEARCH QUESTIONS

To achieve the purpose of the study, answers to the following questions were sought:

Major Questions

1. What are the common characteristics of the categories of word meaning and the means of expressing these categories as revealed in the oral language of elementary school children at each of four age levels?
2. What differences in the characteristics of the categories of word meaning and the means of expressing these categories occur across the four age levels?

Additional Questions

1. What changes in categories of meaning emerge in response to:
   a. verbal stimuli?
   b. real and/or vicarious experiences?
   c. visual representations?
2. How are the changes in categories of meaning, arising from responses to varied and selected stimuli, revealed in children's oral language?
3. What effect does the adult-child setting have upon the child's oral expression of word meaning as compared with the adult-group setting?

IV. DESIGN OF THE STUDY

Sample

A sample of children was drawn from three elementary schools located in a residential middle class community adjacent to the city of Edmonton. The sample consisted of thirty-two individuals and eight groups of four children each. There were eight individuals and two groups at each of four ages: six, seven, nine, and eleven years. All children in the study were considered average language users by their language arts teachers and scored between 100 and 115 on a group intelligence test administered by the researcher.

Instrument and Procedures

Open-ended responses. Eighteen stimuli were selected to provide an opportunity for open-ended responses from the subjects. The stimuli were organized as three kinds of tasks, verbal stimuli, real and/or vicarious experiences, and visual representations, with six stimuli for each task. The individuals in this sample responded to all tasks; the groups of children responded only to the first task, verbal stimuli.

Controlled responses. Tasks requiring responses to specific questions were designed for the purpose of extending the findings from the open-ended responses. These tasks were given only to the individuals.

V. ANALYSIS OF THE DATA

Criteria for an analysis of the data were drawn up on the basis of (1) the research literature and (2) responses of the subjects in a pilot study. These criteria, which were validated by a panel of judges, were applied to the subjects' responses. A second panel of judges checked the reliability of the analysis.

VI. DELIMITATIONS AND LIMITATIONS OF THE STUDY

The following factors limit the interpretation of the findings:

1. The results are generalizable only to the sample studied: children, average in intelligence, living in a middle class suburban community.

2. Individual responses probably varied in accordance with the background experience of each child. For this reason, the study focussed on the pooled responses of a number of students at each age level.

3. Since each task required an oral response, some children may have been limited by this mode of expression.

VII. SIGNIFICANCE OF THE STUDY

Operational research evidence indicating characteristics of word meaning at different age levels is available in limited amounts. Most of the studies were designed to elicit convergent responses to selected words. One study (Siemens, 1973) and a number of local

projects approached word meaning through an analysis of responses of a more divergent nature. Most earlier studies focussed on a narrow age range. An in-depth study including children ranging in age from six years to eleven years and tasks emphasizing both convergent and divergent responses appeared to be another approach. This exploratory study should contribute to the existing knowledge of children's word meaning.

VIII. ORGANIZATION OF THE STUDY

Chapter I provided the reader with an introduction to the research problem and the methodology employed in the examination of the problem. The remainder of the study is organized as follows:

1. Chapter II presents a rationale for the research problem. The rationale and the related studies lead into a model for word meaning which concludes the chapter.

2. Chapter III applies the rationale and model in the description of the research design.

3. Chapter IV reports the findings of the study.

4. Chapter V concludes the report with the summary, conclusions, and implications of the research.

5. The following information relevant to the study is included in the appendices:

   a. Description of the Research Instrument

   b. Report of the Pilot Study

c. Instrument for the Validation of Criteria for Analysis of Oral Responses.

d. Subjects' Responses to Question 14, Task 4.

CHAPTER II

RATIONALE AND RELATED STUDIES

This chapter provides various elements of the rationale for a study in the nature of change in word meaning as expressed in the oral language of elementary school children of different ages. First, there is a brief overview of selected meaning theories, followed by a review of theories relative to the thought component of meaning and ways in which the component might be expressed verbally. Variables considered to be influential factors in the development of word meaning are outlined.

Another portion of the chapter provides a review of selected studies related to methods of measuring quality, as well as quantity, of word meaning; namely, through context, by definition, with the Semantic Features test, and through oral responses to varied tasks.

The chapter concludes with a theoretical model for word meaning and leads directly to Chapter III, a description of the design created to implement the model.

I. THEORIES OF MEANING

In this section, some theories of meaning and the related weaknesses of the theories identified in the literature are reviewed. This resumé provides background

for the theoretical model basic to the present study.

Word Meaning as Union of Speech and Thought

> Word meaning is a phenomenon of thought only in so far as thought is embodied in speech, and of speech only in so far as speech is connected with thought and illumined by it. It is a phenomenon of verbal thought or meaningful speech--a union of word and thought (Vygotsky, 1962, p. 120).

Rather than separating speech and meaning, Vygotsky favored analysis into units, units which cannot be further subdivided without losing the properties of the whole. He maintained that this unit is found in word meaning. His view is summed up in the following statement:

> The nature of meaning is not clear. Yet it is in word meaning that thought and speech unite into verbal thought. In meaning, then, the answers to our questions about the relationships between thought and speech can be found (Vygotsky, 1962, p. 5).

Naming and the Mental Image

According to the mental image theory, whenever the word occurs, an image appears in the mind of the receiver. However, many people have reported a lack of mental image for words they understand and use successfully in labelling referents.

Meaning as a Particular Response

Meaning as a particular response may be subdivided: meaning as an implicit response and meaning as a mediating response (Brown, 1958). Implicit reactions comprise movements of the larynx and other parts of the body. Immobi-

lization of relevant muscles would suggest loss of meaning--a major weakness in the theory.

Verbal mediation theorists believe that the relationship between symbol and referent determines a child's meaning. Evanechko (1970) summed up the mediational theory as follows:

> The mediational view of meaning suggests a relatively unique kind of semantic organization underlying each individual's verbal behavior. . . . this organization might be considered to comprise a multidimensional semantic space which serves to process words for the individual. . . . the individual learns that words can stand for different dimensions of relevance of environmental data, e.g., physical attributes . . . (pp. 17-18).

Osgood (1967) has criticized the separation of symbol and referent. He prefers to tie his hypothesis to observable stimuli and responses.

Meaning as a Behavior Disposition

The behavior disposition theory views meaning "as the total disposition to make use of or react to a linguistic form (Brown, 1958, p. 108)." This study of overt behavior has been criticized for neglect of the abstract areas of meaning and syntax (Langacker, 1967).

Words and Concept Development

Word meaning enhances the child's concept development. This development begins with the world of experience which becomes simplified and generalized. From this stage arise symbols. According to Vygotsky (1962), the symbol, or word, refers to a group or a class of objects which

is already a generalization, a verbal act of thought. Word meanings develop, that is, there are changes in the content of the words and also in "the way in which reality is generalized and reflected in a word (Vygotsky, 1962, p. 122)." Following a review of the literature in the nature of concepts in the language and the notion of meaning, Evanechko (1970) concluded:

> A word is merely a label for an internal cognitive organization, being indirectly connected to the referent through the thought processes of the individual (p. 62).

It is difficult to accept totally any theory of meaning. In this study, the investigator draws upon the points of view of several theorists and views meaning as a thought process which occurs in the indirect relationship between a symbol and its referent. The thought process is considered to be the union of two components: (1) the thought component, and (2) the speech component. Whatever the child produces verbally serves as the vehicle for determining to some extent the nature of his thought. The model outlining this point of view appears in the last section of this chapter.

II. THE THOUGHT COMPONENT OF MEANING

Theories Regarding Stages in Cognitive Development

In the examination of the characteristics and nature of the differences in word meaning at a number of age levels, an overview of theories about stages in

cognitive development provides a framework within which strategies of meaning and reflection of meaning in words may be examined. The cognitive theories of Piaget, Bruner, and Vygotsky are outlined and related to the selection of age groups for the major study.

The three theorists noted above tended to speak of cognitive development in relation to specific periods of time: Piaget in "stages"; Bruner in "modes of representation"; and Vygotsky in "phases." Figure 2.1 provides an overview of the cognitive developmental sequence stated by these theorists and affords the opportunity to compare the stages of development graphically.

Piaget's stages. Piaget (1964a) referred to four main stages in the development of operational structures:

> Stage I: The sensori-motor level--birth to one and a half or two years.[a]

This stage is characterized by a succession of assimilations whereby sensori-motor schemes lead to new combinations and internalizations.

> State II: The level of semiotic or symbolic function (Preoperational representation) --one and a half years to seven or eight years.

Beginnings of verbal language basic to thought or representation appear.

---

[a]Piaget and Inhelder (1969) stated that the ages given are always average and approximate.

<table>
<tr><th>Chrono-logical Age</th><th>Piaget</th><th>Bruner</th><th colspan="2">Vygotsky</th></tr>
<tr><td rowspan="12">1 year
2 years
3 years
4 years
5 years
6 years
7 years
8 years
9 years
10 years
11 years
12 years</td><td>I.
Sensori-motor</td><td>I.
Enactive system</td><td colspan="2" rowspan="2">I.
Primitive structures</td></tr>
<tr><td rowspan="3">II.
Semiotic
or
symbolic
function</td><td>II.
Ikonic system</td></tr>
<tr><td rowspan="4">III.
Symbolic
or
linguistic
system</td><td colspan="2">II. Syncretic formations</td></tr>
<tr><td rowspan="3">III.
Concrete operations of thought</td><td rowspan="3">III.
Thinking
in
complexes</td><td>subjective impression →
grouping on basis of one trait →
linking pseudo concepts →
potential concepts</td></tr>
<tr><td rowspan="2">IV.
Formal operations of thought</td><td rowspan="2">IV.
Formation of true concepts</td></tr>
</table>

FIGURE 2.1

COGNITIVE DEVELOPMENTAL SEQUENCES

Stage III: The level of concrete operations of thought and interpersonal relations--seven or eight years to eleven or twelve years.

The child is now able to relate to classes in terms of objects and to groups of objects and to relations between objects. Conservation is developed, that is, the child can retain at least two variables in his mind as he thinks about categories.

Stage IV: The level of propositional operations --eleven or twelve years to fourteen or fifteen years.

The child is freed from operating in the concrete. He can now reason on hypotheses, not only on objects.

According to Piaget, this development is affected by four main factors: maturation, experience, social transmission, and equilibration, or self-regulation. Concerning the most fundamental factor, equilibration, "each level is determined as the most probable given that the preceding level has been reached (Piaget, 1964a, p. 14)."

Bruner's modes of representation. Bruner (1966a) divided Piaget's sensori-motor level into two modes of representation, beginning with internalized movement patterns in the enactive system and progressing to the employment of alternative courses simultaneously in the ikonic system. Through language, the child, at approximately two years of age, extends the enactive and the ikonic modes of representation. Bruner referred to this mode of representation as the linguistic or symbolic

system.[a] He explained that the "symbolic representation stems from a form of primitive and innate symbolic activity that, through acculturations, gradually becomes specialized into different systems (Bruner, 1966a, p. 30)." Bruner considers language as the most specialized natural system of symbolic activity. In addition, "the child's use of language is categorical. Words cover classes of things, and these classes are, on close examination, found to be rule-governed so that new members can be added (Bruner, 1966a, p. 32)."

Vygotsky's phases. Vygotsky (1962) outlined four major phases by which the language of the child influences thought.

Phase I: Primitive structures--birth to approximately two years.

In the initial phase, the child begins the exploration of his environment through the observation of his universe and manipulation of objects. Imitation and symbolic play begin toward the end of the period.

Phase II: Formation of syncretic heaps--two years to four years.[b]

In this phase, the child creates groups at random, followed by the syncretic organization of the child's visual field. Finally, the child is able to select

---

[a]Britton (1970) sees all three stages as symbolic and therefore prefers to refer to Bruner's stage 3 as linguistic.

[b]All ages are approximate.

elements from different groups or heaps to form a syncretic image.

Phase III: Thinking in complexes--four to eleven years.

This period is also represented by a number of stages. First, objects are organized by subjective impressions and by bonds, both concrete and factual, existing between the objects. For example, the child recognizes the meaning of a family name as a group of objects related in various ways. In the next stage, objects are grouped on the basis of one trait in which they differ (e.g., shape). Next comes a time when meaning is carried from one link to the next without a hierarchical organization (e.g., switching from red circle to red square; to yellow square to yellow triangle). The child selects an object because it reminds him of another object.

The final stage of Phase III is represented by psuedo-concepts, the bridge to true concepts, and by potential concepts, another forerunner of true concepts. At this time, the generalizations formed in the child's mind coincide in content with the adult concept but the process by which they are reached is different. According to Vygotsky, in the phase of potential concepts, objects are grouped on the basis of a single attribute (e.g., shaped like a ball), whereas in the preceding phase objects were grouped on the basis of maximum similarity (e.g., several attributes alike). The practical thinking

involved in this stage suggests a similarity to Piaget's stage of concrete operations.

Phase IV: Formation of true concepts--eleven years →

The final phase in Vygotsky's theory is the period of true concepts. It is a time when the child can view an abstract element "apart from the totality of the concrete experiences in which they are now embedded (Vygotsky, 1962, p. 76)." The child can now combine synthesis with analysis and employ hypothetical statements and propositions. The phase of true concepts operates in conjunction with the previous phases.

Selection of Age Groups

The plan in the present study was to examine characteristics of children's word meaning at various stages in cognitive development and to note the changes in these characteristics temporally. Two basic considerations in the selection of age groups were: (1) a synthesis of the cognitive developmental sequences outlined by Piaget, Bruner, and Vygotsky and (2) consideration of the length of the period of schooling.

When children of approximately six years, seven years, nine years and eleven years were selected, it was assumed that all of them could employ the linguistic system (Bruner, 1966a) and think in complexes (Vygotsky, 1962). Children, ages six and seven years, represented the approximate period of transition from symbolic

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function to concrete operations (Piaget, 1964a). The inclusion of eleven-year-olds afforded the opportunity of examining the word meaning of children who possibly were functioning in the area of concrete and/or formal operations (Piaget, 1964a), also referred to as the period of formation of potential concepts and true concepts (Vygotsky, 1962).

In addition to cognitive development, chronological age was considered in order to standardize years of experience. O'Donnell, Griffin, and Norris (1967) reported two periods of rapid progress in oral expression, "between kindergarten and the end of the first grade and between the end of the fifth grade and the end of seventh (back cover)." Nine-year-olds are reported in the literature to be at a transitory stage in preciseness of word meaning (Werner and Kaplan, 1963, p. 196; McFetridge, 1973). Eleven-year-olds are reported by some writers to be able to think in more abstract terms (Siemens, 1973, p. 279; McFetridge, 1973; Jackson, 1970) and to be explicit (Siemens, 1973, p. 279). Therefore, with consideration for both cognitive development and experience, children ages six, seven, nine, and eleven years and currently in their first, second, fourth, and sixth years of school were selected for the study.

Characteristics of Stages on the Cognitive Continuum

The child who is beginning elementary school has

reached a certain stage in his progress along the cognitive continuum. The particular stage may be different for each individual; however, certain common characteristics appear to be evident.

The child's changing point of view. McFetridge (contribution to the Elementary Language Arts Handbook, 1973) describes the change in a child's orientation to the world between ages six years and twelve years. At ages six or seven years to eight years, the child views his world in the present and from his point of view, that is, in relation to himself. Emphasis is placed on events and how they relate to him personally. Implicit ideas are expressed in discrete units. It appears that the child assumes a shared context with the listener; consequently, his speech lacks preciseness.

During the middle elementary years, ages eight years to ten years, a gradual decentering from this egocentric state takes place as the child begins to gain distance from his experiences. He begins to examine other points of view and to relate one experience to another. He holds the experiences in his mind, accumulates them, and relates them to both past and present.

Toward the end of the elementary school years, ages ten or eleven years to twelve years, the child generally sees the world from several points of view; that is, he can examine experiences in relation to others as well as to himself. Ideas become more explicit,

formulated through direct use of words. Although there is now a noticeable growth toward operating in a detached manner, he reverts to an egocentric state when constraints are placed upon him.

The development of categories of meaning. Another characteristic of the cognitive continuum is the child's development of categories of meaning, an additional means of gaining distance from things. According to Britton (1970), language "provides us with systematically related categories of many kinds (p. 27)" called categories of meaning. These categories are "created by using words to name aspects of experience (p. 195)"; for example, the category of "color" including red, orange, and yellow.

Categorization begins during the child's first eighteen months of life when he names things in his immediate environment. Following further naming, words are used to help build a category. The power of the word increases sharply at this time (Hayakawa, 1962; Britton, 1971).

As the child increases in age he learns "to render discriminably different things equivalent, to group the objects and events and people around us into classes, and to respond to them in terms of their class membership rather than their uniqueness (Bruner, Goodnow and Austin, 1962, p. 151)." His categories will vary according to his experience and, consequently, to his

conceptions of the world. Jackson (1970a) exemplified this development through considering what the word "orange" might mean to a child. Moving from responses of the child of five or six years to the child of eleven or twelve years, one might expect the following responses:

"It's round and has a skin."

"It's round, bright and you eat it."

"It's a citrus fruit."

"It's a citrus fruit slightly larger than a lemon and darker in color."

In conjunction with the development of categories of meaning, increasing interrelationships between these categories become evident (Britton, 1971). These interrelationships provide the foundation for higher thought processes. Although the older child may learn to deal with these higher levels of abstractions, he may find it necessary to reach down to lower levels in confronting situations to clarify meaning.

The concrete to abstract dimension. Cognitive development along the concrete to abstract continuum moves from a reliance on objects and experiences at pre-elementary and early elementary school years, through a period of first degree operations in the elementary years to a period of second degree operations which occurs in the post-elementary years (Ausubel, 1963).

In the earliest period, the child uses language to represent objects and experience. He manipulates

relations between objects rather than between symbolic representations. During the period of first degree operations one can note a direct reference to objects. The child then reasons from a particular set of data and groups data into classes based on concrete, experiential data. The period of second degree operations, late elementary but mainly post-elementary, is a time when ideas are formulated and tested on the basis of verbal operations. The child is now able to consider ideas about ideas, to consider ideas that are possible.

All children do not move together simultaneously through these stages from concrete to abstract reasoning. Depth and variety of experiential background are contributing factors to the uneven progression. Even when the child is able to operate primarily in the abstract domain, he may revert to concrete and preoperational stages when confronted with a new or unfamiliar situation. However, he may move through the stages rapidly to arrive quickly at the abstract.

Summary

The literature suggested a developmental sequence in the cognitive development of a child. The cognitive component of meaning for each child is different, shaped by the nature of the cumulative experiences in his particular linguistic environment. Upon entry into the school environment, he tends to be egocentric in his actions and responses. A generally increasing detachment

from things and events related to himself can be observed as he grows older. The child becomes increasingly able to work in abstract as well as in concrete terms. Using the cognitive development sequences and the number of years in school as guidelines, children from four age groups were selected for study. Other variables which entered into the final selection are reported later in this chapter and in Chapter III.

Some strategies of meaning which become available to him as he shapes a meaning for his world are presented in the next section.

III. WORD MEANING AND EXPRESSION IN ORAL LANGUAGE

Theorists have indicated the existence of a discrepancy between the strategies of meaning available to the child and the strategies which he traditionally employs. Strategies of meaning refer to the ways of selecting and organizing categories of meaning that are available to the child. The discrepancy has been referred to as the sharp difference between language competence (knowledge of a language) and language performance (use of a language) (McNeill, 1966, p. 17). In spite of this limitation, it seems the only way one is to determine some part of a language known is to examine some part of the language produced. Such an approach was used in this study to help determine the nature of strategies employed by children at various age levels as they gave shape

to meaning.

Directions of Growth in Word Meaning

McFetridge (1973) hypothesized that growth in word meaning of children ages six to twelve years would take a number of directions. One hypothesis stated directions of growth in quantity of word meanings:

> Increased number of criterial properties observed and labelled.

The other hypotheses stated directions of growth in quality of word meanings:

> Increasing refinement of labels for any criterial property.
>
> Increasing repertoire of expressions available to express ideas.
>
> Increasing refinement of critical attributes that define classes.
>
> Increasing application of word to more objects, in more contexts, in more times, from more points of view.

Illustrations for each of the hypotheses (Tables 2.1 and 2.2) were found mainly in children's responses in a language project and partly in the research literature. Additional research to test the hypotheses which were basic to the study was needed.

Explicitness Through Language Structure

The language structures that carry the meaning in the oral and written expression of children have been

TABLE 2.1

DIRECTIONS OF GROWTH IN QUANTITY OF WORD MEANINGS

Hypothesis	Task	Categories of meaning	Chronological ages in years at which criterial properties were given		
			6	8	12
Increasing number of criterial properties observed and labelled	Speaking about horses	Color		*	*
		Shape			*
		Size		*	*
		Texture		*	*
		Weight			
		Taste			
		Smell		*	*
		Sound			
		Actions	*	*	*
		Qualities		*	*
		Use	*	*	*
		Function		*	*
		Part-Whole	*	*	*
		Where it Lives	*	*	*

TABLE 2.1 (continued)

Hypothesis	Task	Categories of meaning	Chronological ages in years at which criterial properties were given		
			6	8	12
Increasing number of criterial properties observed and labelled	Speaking about horses	Class Names and Others of Same Class	*	*	*
		Connotation (personal, individual meaning)	*	*	*
		Variety of contexts in which known		*	*

TABLE 2.2

DIRECTIONS OF GROWTH IN QUALITY OF WORD MEANINGS

Hypotheses	Tasks	Illustrations for chronological ages in years		
		6	8	12
Increasing refinement for any criterial property	Speaking about horses (action)	run	jump, buck	run, fast, bucking, loping, galloping
	Speaking about horses (color)	brown	well, sorta reddish-brown	chestnut
Increasing repertoire of expressions available to express ideas	Speaking about horses (sounds)	They sound like this (demonstrates)	Kind of a snort, like this (demonstrates)	Neighs, a snorty kind of sound like this (demonstrates)

TABLE 2.2 (continued)

Hypotheses	Tasks	Illustrations for chronological ages in years		
		6	8	12
Increasing refinement of the critical attributes that define classes	Speaking about an orange	It's round and has a skin	It's round, bright and you eat it	It's a citrus fruit slightly larger than a lemon and darker in color
Increasing application of words to more objects, in more contexts, in more times, from more points of view	Speaking about horses	a horse (the one he knows at his uncle's farm)	horse (three or four horses--at the zoo, the farm and in a movie)	horse, knight's horse, seahorse, clotheshorse

examined by some researchers (Loban, 1963; O'Donnell, Griffin and Norris, 1967). In a longitudinal study extending from kindergarten to grade six, Loban reported certain findings which suggest how the child achieves explicitness with his language. The major finding was relative to structural patterns of the children's language. Loban (1963) reported:

> Not pattern but what is done to achieve flexibility within the pattern proves to be a measure of effectiveness and control of language at this level of language development (p. 84).

The use of movable elements and subordination helped to achieve this flexibility. With increase in chronological age, the subjects in the study showed an increasing use of subordination. Comparing the high group with the low group, the high group displayed a greater repertoire of clauses (movables). The incidence of adverb and noun clauses was greater than incidence of adjective clauses in the total group.

In a study of kindergarten and elementary classes, O'Donnell and associates (1967) reported some findings which give further evidence about the growth in language structure. They found "largest overall increases and most frequent statistically significant increments from grade level to grade level were found in the use of coordinate constructions, and of nominal constructions containing adjectives, participles and prepositional phrases (back cover)." They also noted two periods indicating a spurt in the growth of the speech component,

between kindergarten and the end of first grade and between the end of grade five and the end of grade seven.

Two important factors in the two studies were considered in the plan for a further study in word meaning. First, meaning is not always reduced to single words but often is communicated in groups of words (e.g., phrases, clauses). Consequently, there was a need to look at more than separate words, but also to look at the other language structures and the way they are used to convey meaning. Second, according to the studies, word meanings develop as the child's age increases, with growth spurts occurring at approximately grades one and six. These two points in age, plus two intermediate points, were represented in the study.

IV. VARIABLES CONSIDERED IN SAMPLING MEANING

Earlier in this chapter, the importance of chronological age, language competence, and language performance were discussed as influential variables in assessing a child's language development. In addition, other important variables must be considered:

Oral Mode of Expression Versus the Written Mode

Both the oral and written modes of expression have certain advantages and disadvantages. The advantages of the oral mode include the opportunity to react directly with an audience, to enhance meaning through

intonation, stress, pitch, facial and expressive gestures, and to use one stimulus across a number of age groups. However, the speaker is unable to revise his production once it has been delivered.

A major advantage of the written mode is the opportunity to develop a web of meaning through re-examination and revision of the written material. Disadvantages of this mode include the lack of simultaneous interaction with an audience and the limitations of inadequate facility in spelling and the mechanics of writing, especially with children in the early elementary years. The abstract nature of writing also must be considered as a constraint, at least for young children.

The purpose of the study was to explore the nature of change in word meaning at four different age levels. Since all the children would not be fluent in the written mode, the oral mode was chosen for this study.

Open-Ended Responses and Controlled Responses

Samples of children's language may be acquired through open-ended responses or through controlled responses. Through the less controlled production (e.g., telling all he can about "horses"), the child is free to move divergently in categories of meaning as he gives shape to the word. In the controlled responses (e.g., responding to a specific question about the color of a horse), he must converge on a specific task. Open-ended

responses are considered a means of acquiring evidence regarding directions and quality of growth in word meaning. On the other hand, controlled tests are needed to fill the gap of specific meaning resulting from inadvertent omission of categories in the open-ended responses. Cazden (1972) expressed a similar thought about the omission of a particular structure in a child's spontaneous language, and suggested the need then to look for that structure in an obligatory context. She asked:

> If a particular construction does not appear in a certain transcription of the child's speech, is it missing from the child's linguistic competence or only from this sample of his performance (p. 31)?

Therefore, to acquire both divergent and convergent responses in several samples of children's language, several tasks related to a variety of stimuli were needed in the instrumentation of the study.

The Child's Experience

Experience may be considered relative to the child's background, the nature of the task, and previous interaction with people in varied social settings. Through previous and current experience, the child builds an increasing number of word choices. The importance of this increasing number of words and its relationship to the generation of ideas is evident. As Duckworth (1972) stated:

> The more ideas a person already has at his disposal the more new ideas occur, and the more he can coordinate to build up still more complicated schemes (p. 231).

The nature of the experiences provided in a

structured setting influences language production. A word with a concrete referent (e.g., word "horse"), usually elicits more criterial attributes than a word with an abstract referent (e.g., word "birthday"). Organization of stimuli along a concrete to abstract continuum makes provision for a wide range of responses. Carefully selected stimuli also can activate a number of the child's senses. Therefore, in the present study, selection of a wide variety of stimuli for real and vicarious experiences was necessary.

One important component in the formation of the child's personal lexical categories is the nature of his personal interactions in his linguistic community. The child's parents may be considered part of his linguistic community. Brown and Bellugi-Klima (1971) studied the grammatical characteristics of the utterance of two young children, Adam (27 months) and Eve (19 months). They found that not only do children imitate and reduce the adult expression but also that adults expand the child's language through adding functors to the child's contentives. Consequently, Brown and Bellugi-Klima concluded:

> It seems to me that a mother in extending speech may be teaching more than grammar; she may be teaching something like a world view (p. 313).

Although these observations were made with reference to pre-school children, Bruner (1966b) suggested that "some extension of this process goes on throughout childhood--

with parents, teachers and older children (p. 15)."

The subjects of Brown and Bellugi-Klima's study were the children of highly-educated parents. In another well-known study Bernstein (1961) examined the impact of social class on the language development of a child. He observed a generally concrete, implicit language in children of the lower-working class compared with a far more elaborated code in children of the middle class. This observation led him to conclude:

> It is not a question of vocabulary: it is a matter of the means available for the organization of meaning and these means are a function of a special type of relationship (p. 167).

It seemed important to study children who were somewhat alike in experience and to provide them with identical and varied stimuli in responding to common tasks.

Value of Interaction

Experience, without an opportunity to organize and internalize it, is of questionable value. Time to discuss an experience with adults, or with the peer group, and to relate the new experience with a previous or a simultaneous experience, helps the child to build his world as well as to build one in common with others (Smith, Goodman and Meredith, 1970). As Buber stated:

> Experience comes to man 'as I' but it is by experience 'as we' that he builds the common world in which we live (In Britton, 1970, p. 19).

One-to-one interaction between an adult and a child is a typical setting in collecting language samples.

Such a setting does not provide, however, for stimulation which may be gained from either support or confrontation of peers. As Rawson (1965) stated, "interaction with peers is a catalyst of cognitive change (p. 13)." For these reasons, these two settings were incorporated in the design of the study to provide a more representative sample of children's word meaning.

Summary

Variables which may influence word meaning were reviewed and incorporated in the design of the study: oral and written modes, open-ended and controlled responses, previous and present experience, and interaction with adults and peers.

V. RELATED STUDIES

Since the early 1950's studies in vocabulary have moved in the direction of the qualitative, rather than the quantitative, nature and development of word meaning. In addition to the theory stated previously, studies which helped in shaping this study on word meaning are reported here.

Studies Related to Word Meaning and Context

Werner and Kaplan (1950) investigated children's acquisition of word meanings through verbal contexts. The sample of children ranged in age from eight years six months to thirteen years six months; in intelligence

ratings from 101 to 111. Artificial words were embedded in a series of sentences. The children, after going from context to context, were expected to arrive at the meaning of the word and to state what way and why the meaning fitted the sentence. Werner and Kaplan reported a gradual increase in the number of correct meanings for the same word as the children increased in age and an abrupt decline in the immature processes of getting meaning (e.g., holophrasis, syncresis, and fluidity) at ages ten and eleven years. The artificial word now showed evidence of being both general and specific at the same time (e.g., "deceive" including both "lie" and "cheat").

The major focus of Laing's (1974) study was to determine how children process word meaning from verbal context. The sample was comprised of children from grades four, six, and eight, ranging in age from nine to fourteen years. Following tests in which the child was required to determine word meaning from context, the subject was asked to explain how he decided on the meaning he gave. Laing found the quality of word meanings was significantly superior across the grades, by age, and by reading ability within the grades. In the interviews, the older subjects exhibited greater control of language as revealed in precision of word meaning.

The two studies supported the desirability of selecting subjects from a broad age range which incor-

porated the upper elementary grades, a period of reported change in quality of word meaning. Laing's interviewing technique suggested a valuable means of finding out about a child's knowledge of word meaning. In the present study, instead of providing a "slot" in which a single aspect of the child's meaning had to be fitted, it was decided to use open-ended responses to reveal as much of a child's word meaning as possible.

Measurement of Word Meaning Through Definition

In two studies from the early 1950's (Feifel and Lorge, 1950; Russell, 1954), children were asked to define selected words and these definitions were analyzed on two different bases. Feifel and Lorge applied a five-fold qualitative category system to responses to the Form L Stanford-Binet Vocabulary Test: (1) synonym, (2) use and description, (3) explanation, (4) demonstration, illustration, repetition, and inferior explanation, and (5) error. Their nine hundred subjects ranged in age from six to fourteen years.

Russell (1954) designed a number of diagnostic multiple choice tests and analyzed the choices to determine breadth, depth, and height of meaning. Breadth was sampled from many areas such as school subjects and hobbies, plus multiple meanings. Depth was an attempt to work beyond synonym to find out what the child understood about words. Height was an examination of development

from year to year. Russell's subjects were drawn from children in grades four to twelve.

Both studies showed evidence of qualitative vocabulary development of the older children as compared with that of the younger children. An analysis of the children's responses led Feifel and Lorge to the following conclusions:

> . . . The younger children significantly more often employed the use and description, and illustration, demonstration, inferior explanation, and repetition types of response, whereas the older children significantly more often used the synonym and explanation types of response.
>
> . . . Younger children perceive words as 'concrete' ideas and emphasize their isolated or particular aspects, whereas older children stress the abstract or 'class' features of the word meanings (p. 17).

Russell (1954) found a fairly consistent vocabulary development from year to year with a considerable fluctuation of gains in vocabulary scores from grade to grade and from subject to subject (p. 372).

During the same period, Gerstein (1949) developed a rationale for classifying children's responses to the Bellevue-Wechsler vocabulary test according to a threefold qualitative category system: (1) description, (2) functional, or (3) conceptual. Her classification scheme was applied in a later study by Jackson (1968). Jackson's grade six subjects, high or low reading groups, were asked to give oral definitions to written words from the core vocabulary of reading and the specialized vocabulary of mathematics. The responses were classified according to Gerstein's scale; the errors according to Feifel and Lorge's

error categories.

Jackson found that both groups exhibited knowledge of core vocabulary in terms of functional and conceptual methods. In specialized vocabulary, the low group employed mainly descriptive responses whereas the high group had a majority of conceptual responses. Comparing core and specialized vocabulary, the two groups differed significantly in three of four qualitative levels. There were some similar patterns: (1) more functional responses to core vocabulary; (2) more descriptive and error responses in specialized vocabulary.

Grant(1965) conducted a qualitative analysis of the vocabulary responses of good and poor readers at the grade six level using the vocabulary subtest of the Stanford-Binet Intelligence Scale Form L. She analyzed the children's responses according to Feifel and Lorge's five-fold classification system.

Grant found that good readers tend to use a greater number of abstract responses than do poor readers. They seemed to conceptualize on a more complex level. The poor readers tended to respond in terms of more immediate and concrete criterial attributes.

These studies reported qualitative growth in children's word meaning according to increase in age (Feifel and Lorge, 1950; Russell, 1954) and with improvement in reading ability (Grant, 1965; Jackson, 1968). These findings are supported in a later study done by

Grant (1972). She stated:

> The findings suggest that the construct of qualitative levels of growth in language is valid (p. 278-279).

However, a major limitation seems to be inherent in all of these studies. Asking for a definition to a word in a closely structured context would appear to restrict the child's opportunity of giving his total meaning for a word. Furthermore, the limitations of classifying responses according to three or five categories might leave some aspects of meaning unclassified. An alternative plan seems to be to encourage a child in "telling all he knows" about a word and in classifying responses according to a greater number of categories. Thus, the present study was planned to ask children from a number of age levels to reveal all of their meanings for a variety of stimuli. The responses were to be analyzed according to nineteen categories of meaning derived from the literature. In addition, attention was to be given to the way the meaning was expressed.

Measurement of a Child's Meaning Space

Evanechko (1970) developed a Semantic Features Test to identify and describe the characteristics of children's language competence at two points, grade five and grade eight. According to Evanechko and Maguire (1972), "children's language competence was considered to result from their organization of semantic relationships for the purpose of ascribing meaning to

words (p. 507)." This organization was considered as a multidimensional meaning space which the child utilized in processing words.

From a survey of the literature, Evanechko produced twenty-four kinds of relations between words (categories of meaning) which were thought to comprise the child's meaning space. The research instrument consisted of a number of paired comparisons whereby the subject was asked to choose the "better" definition for each word. The Semantic Features Test provided a measure of the way a child processes linguistic stimuli and, consequently, a means of inferring "level and adequacy of conceptual functioning of which the individual was capable (Evanechko, 1970, p. 64)."

It was found that the subjects in both grades preferred definitions involving class and synonym. However, the grade 5 subjects preferred personal, concrete definitions (i.e., in relationship to their own experience), whereas the grade 8 subjects were able to function at a more abstract level (i.e., in class membership terms). Evanechko successfully illustrated the usefulness of the instrument in describing the semantic functioning of children at two different grade levels. Evanechko's findings supported the findings of Feifel and Lorge (1950) cited earlier.

Evanechko's study showed the importance of looking at a child's total meaning space. His findings suggested

little change between the two age groups in preference for categories of meaning. The main difference occurred in the organization of the meaning within a category with the older subjects using superior types of strategies. It appeared that further research involving children in grades one, two, four, and six would provide additional information regarding categories used and the interrelationship between the categories.

Payne (1972) arranged Evanechko's (1970) twenty-four categories of meaning into five clusters; namely, (1) meanings based on experience, (2) meanings determined by context, (3) meanings based on feelings, (4) meanings based on explanation of words, and (5) meanings based on class membership. An instructional unit was devised for each cluster and tested in classrooms to help children discover and use many of the categories of meaning. She found in her interviews with children that they appeared to be aware of various categories and strategies of meaning. On the basis of the interviews, Payne tentatively hypothesized that all children, regardless of age, apply all categories of meaning but apply them in the ways characteristic of their ages. Further investigation was required to find what categories children use, and also when and how they apply them.

Examination of Word Meaning Through Children's Oral Responses to Varied Tasks

In one of the most recent studies, Siemens (1973) examined samples of children's oral language to determine the relationship between "the child's language power and thinking power, and his language production (Siemens and McFetridge, 1974)." Children from two age groups, approximately nine years and twelve years, participated in the study.

Seven oral descriptive tasks, arranged in order of difficulty from simple to complex, made up the research instrument constructed by Siemens. Five of the tasks were designed to reveal information about the children's basic cognitive skills. The two remaining tasks required organization of ideas in the description of an event.

Major findings resulting from the descriptive task, "Criterial Properties," were as follows. Relative to the concrete-abstract dimension, the number of categories of meaning appeared to be a function of age and facility with language. For example, the older groups and the high language users within an age group employed a greater number of categories of meaning. The most frequently identified categories for all groups were "color," "size," "use," "part-whole relations," and "class name." Average language users in the nine-year-old group named fewer component parts of stimuli than did any of the other groups. Comparing the verbal stimulus of "horse"

and the pictorial stimulus of "dog," the strictly verbal stimulus, produced a greater number of categories of meaning among high and average language users of both age groups. In the task, "Comparison and Contrast," use and function were the categories most frequently identified.

Siemens reported evidence of qualitative differences in expression of meaning within both age groups; however, this increased quality was more obvious for the older group and for the high language users within each age group. The older groups also tended to be more explicit in their responses, to have a greater repertoire of words, and to make more attempts in working with abstractions.

In examining a child's word meaning, Siemens looked at whatever portion of response carried the meaning, whether it was a single word, a phrase, or a sentence. Her method of interviewing the children personally with a variety of stimuli suggested a similar procedure might be used for examining word meaning in the present study.

VI. A MODEL FOR WORD MEANING AS A THOUGHT PROCESS

Word meaning, in this study, is viewed as a thought process. Word meaning is considered as the indirect relationship between referent and symbol by way of the thought processes (Ogden and Richards, 1946; Evanechko, 1970). It is during these thought processes that language as one way of representing experience

imposes " a grid upon the multiplicity of sense impressions (Britton, 1971, p. 31)." In addition, the choice of words in an utterance reflects the speaker's knowledge of a referent (Olson, 1970). Olson (1970) added:

> Everything has many names and every name 'has' many things. . . . Presumably, something mediates between the word and the thing; this mediator is called meaning (p. 262).

In word meaning, thought and speech unite into verbal thought (Vygotsky, 1962). Word meanings change; therefore, the relation of thought to word also changes. Word meaning becomes a process--"A process that is undergoing constant change (Stauffer, 1969, p. 294)." Furthermore, as Payne (1972) stated:

> The term 'process' implies a processor, an active agent, who constantly provides semantic attributes for these word forms. As each agent differs, the semantic process of a word also differs; therefore, meaning of a word is not inherent in the word but resides in the processor (p. 9).

What meaning the sign will contain for the processor is dependent upon his total behavior while the sign-process is being established (Osgood, 1967, p. 163). The meaning is related directly to experience which varies for each individual; therefore, reference varies (Olson, 1970). Additional criterial properties may result in reorganization of the categories of meaning and the relationship between them, thus creating a change in word meaning. In other words, the rules of "the language game" (Wittgenstein, 1958) change.

The fact that reference may be symbolized in

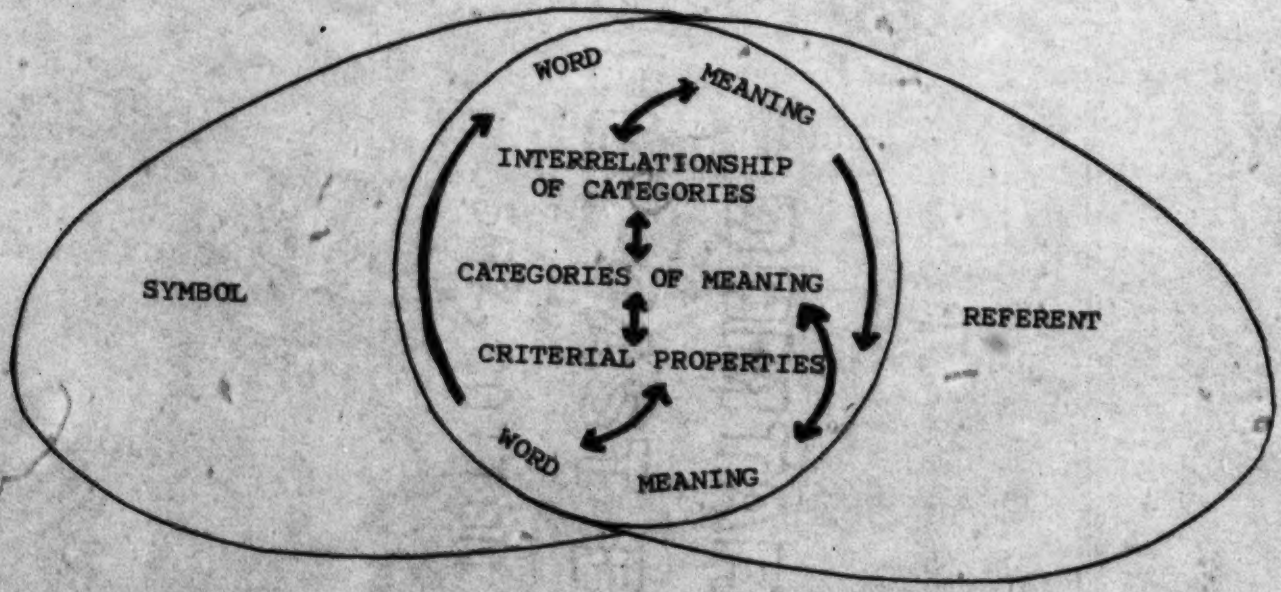
more than one way must be accepted (Olson, 1970). Britton (1971) agrees but goes on to emphasize the role of language:

> Language is only one way of representing experience but as such it plays a key role because it becomes the means of organizing all the other forms of representation (p. 31).

According to a number of theorists (Piaget, 1964; Bruner et al, 1962; Vygotsky, 1962; Hayakawa, 1962), children in the approximate age group of six years to eleven years think about objects and events through a categorical use of language which becomes rule-governed. The organization of language is revealed verbally in terms of organization and reorganization of both criterial properties and categories of meaning, as well as the interrelationships between them.

The core of the model (Figure 2.2) suggests a dynamic process whereby the individual categorizes his experiences and relates them to each other in building word meaning. Beginning with an increase in the quantity and quality of criterial properties (e.g., color, shape, action [McFetridge, 1973]), the child organizes these properties into categories of meaning (e.g., properties, class names, connotations, contexts [McFetridge, 1973]; oppositeness [Britton, 1970]; and synonymity [Britton, 1970; McFetridge, 1973]).

Britton (1970) stated the importance of a number of the interrelationships of these categories of meaning. For example, he cited an instance whereby the meaning for



The core of the model represents word meaning as a changing, dynamic process relating symbol to referent. The process begins with the labelling of criterial properties of the referent. These properties are organized into categories of meaning. Additional criterial properties may be added resulting in the reorganization of a category and a change in word meaning. As new categories of meaning are formulated, they become interrelated thus forming an organizational framework for the child's total word meaning.

FIGURE 2.2

WORD MEANING AS A THOUGHT PROCESS

"mild" in the context of winter is different from the meaning for "mild" in the context of summer. He also emphasized the hierarchical relationship between word meanings as the most "far-reaching influence upon our thinking (p. 196)." Classification of varied shades of a particular color was cited as an illustration. The capacity "to impose superordinate structures in the interest of seeing things more simply and deeply is seen as one of the powerful tools of human intelligence (Bruner, 1962, p. ix)."

In this study, the investigator examined children's oral responses, open-ended and controlled, in an attempt to determine the commonality and variability of word meaning at four age levels and to note the sequence of change in word meaning from one age level to another. These responses were analyzed principally in terms of criterial properties and categories of meaning.

CHAPTER III

DESIGN OF THE STUDY

The design of the study is reported in this chapter. Included are: procedures used for selecting the sample; instrumentation; procedures for gathering data; and analysis of the data. References to the pilot study are made throughout the chapter. A detailed report of the pilot study is included as Appendix B.

I. SELECTION OF THE SAMPLE

The Ss (subjects) for the study were drawn from schools in a community of approximately twenty-five thousand people located adjacent to the city of Edmonton, Alberta. The assistant superintendent of the county, in cooperation with the school administrators, selected three elementary schools which were considered representative of middle socio-economic status. The total school population in these three schools numbered approximately 1500 in March, 1974.

Careful consideration was given to a number of variables which might affect a child's word meaning. The variable of chronological age was controlled by selecting Ss who were in their first, second, fourth or sixth years of school and had never been channelled into a slower

stream. In addition, chronological ages were restricted to six years three months, seven years three months, nine years three months and eleven years three months with an accepted range of plus or minus three months on each year. An equal number of boys and girls was selected at each level.

Language and cognition are related; consequently, it was decided to select children who are "average" in language use and intelligence rating. Intellectual ability was controlled by selecting Ss with measured intelligence quotients ranging from 100 to 115, inclusive. Furthermore, only those Ss designated by their language arts teachers as average language users were considered. If the teacher's opinion was not consistent with the language assessment on the previous year's cumulative record in language, the S (subject) was removed from the sample. In other words, the extremeties of the group, the superior and the below average, were removed.

To reduce bias arising from teacher effect, Ss were selected from three schools and from three or more classrooms at each level. Since experience in rural areas might be somewhat different from experience in urban areas, Ss from farms in the attendance area were not included in the sample.

In the pilot study, Ss were drawn from one school and from two or more classrooms at each level. The possibility of trying to equate the Ss on the basis of

background experience was explored. A check list including the proposed stimuli plus an equal number of stimuli not proposed for the major study was completed by each S within the chronological age range of six years to eleven years, his language arts teacher, and his parents. Each respondent was asked to indicate the degree of the S's experience with each stimulus listed. An examination of the replies showed no consistency among the three groups of respondents on a number of the items. Furthermore, there was no consistent pattern between the Ss' oral responses to the tasks and the experience as indicated on the check lists in a number of cases. Trying to equate Ss on the basis of experience did not appear to be a useful control. Consequently, similar chronological age, intelligence ratings, level of language use, classroom ecology, and residential location served to apply some control in selecting Ss with somewhat similar experiences.

Table 3.1 indicates the distribution of the Ss who qualified for the main study. The final sample was comprised of sixty-four Ss, eight boys and eight girls at each age level. The boys and the girls were randomly assigned to individual interviews and group interviews within each age level. Ss who qualified but were not selected in the sample were designated as spares. If for any reason a S was not available for study, he was replaced randomly from the spares. Thus the sixty-four

Ss were grouped as follows for the study:

(1) Four boys and four girls at each age level were selected to respond individually to all tasks designed for open-ended responses and controlled responses.

(2) Two groups of four, two boys and two girls, at each age level were selected to respond to verbal stimuli designed for open-ended responses.

TABLE 3.1

DISTRIBUTION OF THE SUBJECTS MEETING CRITERIA FOR SAMPLING

Year in School	Chronological Age[a]	Sex	
		Masculine	Feminine
First	6 yr. 0 mo.-6 yr. 6 mo.	12	13
Second	7 yr. 0 mo.-7 yr. 6 mo.	16	14
Fourth	9 yr. 0 mo.-9 yr. 6 mo.	13	10
Sixth	11 yr. 0 mo.-11 yr. 6 mo.	11	13

[a]Age was measured to the nearest month as of March 1, 1974.

II. INSTRUMENTATION

Two instruments were administered to the Ss in this study: (1) an intelligence test to all Ss who met the chronological age requirement, and (2) the investigator's selected tasks to sixty-four Ss who met all the requirements for selection in the sample.

Children's Intellectual Abilities

As part of the screening procedure in selecting Ss

for the study, the investigator administered and scored the intelligence tests listed in Table 3.2. All tests were administered in the two-week-period prior to March 1, 1974. All scores were computed using March 1 in the computation of chronological ages.

The two tests are Canadian adaptations of the American editions of the Cognitive Abilities Test and the Lorge-Thorndike Intelligence Tests originally constructed by R. L. Thorndike, E. Hagen and I. Lorge and later adapted by E. N. Wright.

TABLE 3.2

INTELLIGENCE TESTS ADMINISTERED

Year in School	Intelligence Test	Form
First	Canadian Cognitive Abilities Test	Primary 1
Second	Canadian Cognitive Abilities Test	Primary 2
Fourth	Canadian Lorge-Thorndike Intelligence Tests, Grades 3-9	Level B
Sixth	Canadian Lorge-Thorndike Intelligence Tests, Grades 3-9	Level D

Buros (1972, p. 343) reported reliability coefficients of approximately .90 for each grade level of the tests and suitability of the tests for testing in either large or small groups. Canadian norms are not available.

By following this plan for testing intellectual

ability, the following advantages were realized:

(1) Recent scores for all Ss at each age level;

(2) Canadian editions of an intelligence test for all age levels;

(3) Identical authors for all tests; and

(4) Consistent testing procedures for all groups through the directions of one examiner.

Construction of the Research Instrument

The development of the research instrument is reported under three headings: (1) purpose of the instrument; (2) selection of the stimuli and tasks; and (3) description of the instrument.

Purpose of the instrument. The investigator constructed an instrument to determine children's knowledge of word meaning as revealed through their language. Oral responses were elicited at four age levels: (1) 6 years-6 years 6 months; (2) 7 years-7 years 6 months; (3) 9 years-9 years 6 months; and (4) 11 years-11 years 6 months.

Two types of responses were planned: open-ended responses designed to provide insight into children's word meaning plus controlled responses designed to reveal categories of meaning not produced in the more divergent tasks. Following transcription of the responses, the written protocols were analyzed according to a specified set of criteria. These criteria are stated later in this

chapter under the heading "Analysis of the Data."

Selection of stimuli and tasks. Stimuli and tasks were selected to meet the purpose of the study.

1. Several stimuli for each task were selected to follow a concrete to abstract continuum and, consequently, to include a range of complexity. For example, the referents in the continuum "horse --> pollution --> nervousness" became increasingly abstract. In addition, each word allowed for a range of complexity in understanding. The selected stimuli were chosen from the many stimuli tested in the pilot study. Each stimulus was found to be within the range of experience of the majority of the Ss.

In addition, to investigate whether the response patterns of an age group were specific to a particular set of words, several sets were tested (e.g., "horse," "cat," "dog," "table," "ruler"). The response patterns for each word in a set were analyzed and found to be similar within each age group.

2. The stimuli selected were fandomly assigned to three tasks which were:

a. responses to a verbal stimulus (e.g., given the word "table," telling all he can about "tables");

b. response to a stimulus presented through a real or a vicarious experience (e.g., participating in a game, then telling all he can about "games"); and

c. response to a stimulus presented through

visual representation (e.g., observing a picture of dogs, then telling all he can about "dogs").

A fourth task was designed to elicit specific or controlled responses and to fill gaps in the children's responses to the first three tasks. It consisted of a number of questions and commands (e.g., tasting strawberries, apple, and lemon, then telling about the taste of each).

3. In providing the desired setting for the responses to the tasks, the following procedures were observed:

a. Establish contact with each S and group at least two times on two different days.

b. State the purpose of the interviews with the Ss on two different occasions; namely, prior to the day for collection of oral responses and immediately before the first taping session begins.

c. Provide relaxation periods at least every forty-five minutes and more often if there appears to be a need.

d. Allow unlimited time for responses to each task.

Description of the instrument. A complete description of the instrument is included in Appendix A. There were four groups of tasks.

1. Task 1: Verbal stimuli

Ss responded to the following six verbal stimuli:

table pollution anniversary

horse illness holiday

Each interview was conducted within the following framework:

a. An introductory comment giving the purpose of the interview.

b. A statement to begin the S's response:

Tell me everything you can about (stimulus given). Pretend that I don't know anything about _____ and each thing you tell me will help make it clear to me.

c. An additional statement for reluctant respondents:

Pretend that I'm from another planet and I haven't even heard about _____.

d. Several supporting devices to be employed as the interview progressed:

For example; "yes"; "m-hm"; "good"; "I hadn't thought of that."

e. A question designed for review purposes:

Now let's review what you have told me. What different things have you told me about _____?

f. A final question to elicit additional responses:

Is there anything else you can tell me about _____?

All individuals and groups were asked to respond to the task. The contextual settings were adult-individual and adult-group.

2. Task 2: Real and/or vicarious experiences.

The following six stimuli were provided:

ruler	game	happiness
orange	song	nervousness

Assistance was given first through real experiences (e.g., feeling, smelling, and tasting an orange), or through vicarious experiences (e.g., telling about times of happiness). The questioning framework which followed was identical to the framework used in Task 1: Verbal stimuli. Only individuals were asked to respond to the task.

3. Task 3: Visual representations.

The stimuli were pictures of the following six referents (Appendix A):

seagull	prize	education
dog	job	poverty

Following the examination of a picture, the same questioning framework used in Tasks 1 and 2 was employed in Task 3. Only individuals were asked to respond to the task.

4. Task 4: Controlled response task.

Questions were designed (1) to extend categories of meaning revealed through the previous tasks, and (2) to reveal categories of meaning not produced by the Ss. A series of questions was prepared relative to a variety of stimuli not employed in the other parts of the instrument. Each question was designed to elicit both quantitative and qualitative responses in a particular category of meaning. For example, regarding the category "action of," the S was asked to tell all the different ways a cat

could move from one spot to another. Only individuals were asked to respond to the questions.

III. PROCEDURES FOR GATHERING DATA

The procedures which were followed in gathering intelligence ratings of the Ss and their oral responses to the tasks are reported in this section.

Obtaining intelligence ratings. The intelligence tests were administered and scored by the investigator in a two-week period extending from February 21 to March 6, 1974. Whenever the number of Ss in a group for Years 1 and 2 (Grades 1 and 2) exceeded twelve, an adult assisted. No group was larger than eighteen. In Years 4 and 6 (Grades 4 and 6), groups numbering from twelve to twenty Ss were tested by the investigator without assistance.

The testing period was used also as a time to explain to the Ss their part in the study. The initial contact with each S was established at this point. Subsequent contacts were made during the sessions when oral responses to tasks were given.

Obtaining oral responses to assigned tasks. The investigator administered the instrument to sixty-four Ss, thirty-two individually and thirty-two Ss in groups of four each, following the questioning framework designed to elicit oral responses. Each of the thirty-two individuals was asked to respond to all four tasks. The groups responded

to the six stimuli included in Task 1, response to a verbal stimulus.

The tasks were administered in the same order to every S. Each S began with a practice task. The four tasks were given in numerical order concluding with the extension questions and commands from Task 4. Within each of the first three tasks, the stimuli were organized on a concrete to abstract continuum and given in the same order to each S.

The data-gathering period began on March 7, 1974, and continued for seventeen school days. The length of time required for an individual or a group ranged from forty-five minutes to one hour thirty minutes. The interval was broken at the end of the forty-five minute period by a period of relaxation. More frequent breaks were provided when needed.

All responses were recorded on Sony Low-Noise Auto Sensor tape through the use of a Sony TC 110A cassette taperecorder. The responses were transcribed to written protocols by two transcribers trained by the investigator. All of the protocols from the pilot study and one-half of the protocols from the major study were checked and determined to be accurate.

IV. ANALYSIS OF THE DATA

This section provides information regarding the establishment of criteria for analysis of the data, the

methods of analysis, and validity and reliability of the analysis.

Establishing Criteria for Analysis of the Data

The data were analyzed in terms of a descriptive analysis of the Ss' responses. The criteria for analyzing the data were established according to the following plan:

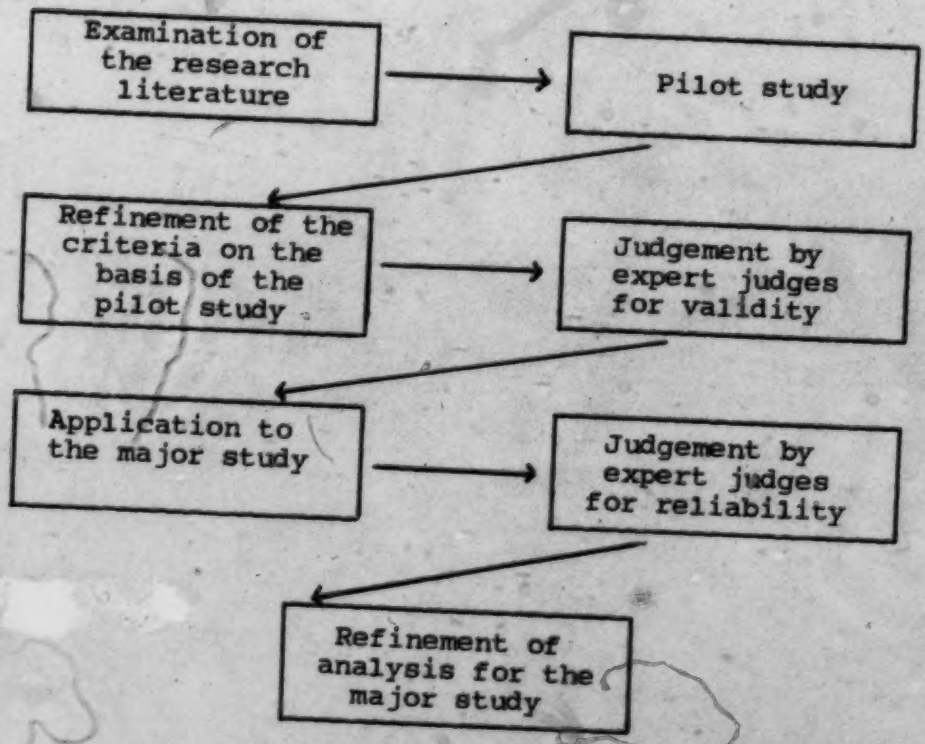

Examination of the research literature
Pilot study
Refinement of the criteria on the basis of the pilot study
Judgement by expert judges for validity
Application to the major study
Judgement by expert judges for reliability
Refinement of analysis for the major study

FIGURE 3.1

ESTABLISHMENT OF CRITERIA FOR ANALYSIS OF ORAL RESPONSES

Initially, the following categories of meaning, or criteria, were derived from the literature:

Categories of Meaning	Examples
color	black
shape	different shapes
size	big
texture	soft fur
weight	heavy
taste	sweeter (meat)
smell	smelly
sound	laughing sound
actions	gallop
qualities	useful
use/function	to pull things
part-whole	mane
location	in the barn
class names and others of the same class	mammal
connotation	fun
variety of contexts in which known	on T.V.; in books

The following revisions to the list of criteria were made as a result of the pilot study:

1. Subdivision of "actions" into "action of" (e.g., "gallop") and "action upon" (e.g., "brush").

2. Addition of "cause" (e.g., "germs" as a cause of "illness").

3. Designation of "size" as "size/length."

Three judges, professors of language arts, were asked to examine the list of criteria for inclusiveness.

As a result, the category of "composition" (e.g., "wood") was added to the list. This addition made a total of nineteen categories of meaning.

Methods of Analysis

All of the Ss' protocols were analyzed as follows:

1. Each protocol was examined to identify words and groups of words that carried the child's meaning.

2. Meaning units were then assigned to the categories of meaning listed as criteria.

3. All responses were pooled within each age group. (No analysis was made of individuals separate from the pooled responses.)

4. All responses of each of the two groups at each age level were also pooled.

5. All patterns of response were examined and related to the research hypotheses (McFetridge, 1973) as follows:

a. Hypothesis 1:

Increasing number of criterial properties observed and labelled within each category of meaning.

The frequency of criterial properties within each category of meaning was recorded. Each statement of a particular criterial property (e.g., "red") was recorded as a point each time it occurred (e.g., "red" given four times by four different individuals was scored as "four" under "color"). In addition, all the multiple meanings given by the Ss were recorded. This procedure provided

a count of the criterial properties, the categories of meaning, and the multiple meanings.

b. Hypothesis 2:

Increasing refinement of labels for any criterial property.

Each expression of meaning (words or groups of words) related to each category was examined to note where refinement occurred.

c. Hypothesis 3:

Increasing repertoire of expressions available to express ideas.

Each expression of meaning in each category was examined to identify the variety of ways in which an idea was expressed.

d. Hypothesis 4:

Increasing refinement of critical attributes that define classes.

Each expression of meaning was examined across the categories to identify the attributes, criterial and critical, that were used to define classes.

e. Hypothesis 5:

Increasing application of word to more objects, in more contexts, in more times, from more points of view.

Each expression of meaning across the categories was examined to determine the Ss' breadth of knowledge of a word as defined by the dimensions of the hypothesis.

Validity and Reliability of the Analysis

The validity and the reliability of the analysis

were established in the following manner.

Validity of the analysis. The investigator prepared a validation instrument (Appendix C) to determine the validity of the categorization of the criterial properties in Ss' oral responses from the pilot study. Three professors of language arts, one working independently and two working cooperatively, examined the instrument to determine (1) the accuracy of the labels assigned to criterial properties in a sample protocol, (2) the accuracy of meaning units identified to illustrate the hypotheses, and (3) the validity of the extension questions. In addition, some meaning units which were difficult to assign to a category were labelled "doubtful" and assigned to categories of meaning by the judges.

In the few instances where there was disagreement, the judges and the investigator discussed the definitions and application of the criteria. Modifications in the definitions of the criteria were made: adding "composition" as a category and clarifying the definitions of "qualities" and "connotation." It was agreed that these refined criteria would provide for a valid analysis of the data.

Reliability of the analysis. The reliability of the investigator's analysis of the Ss' oral responses in the main study was established by two additional judges, both with graduate degrees in language arts.

The judges independently analyzed a representative sample of the responses from the four age levels: individuals' responses to a concrete, a concrete-abstract, and an abstract stimulus from each of the first three tasks, plus one group response to each of three stimuli in the first task.

Inter-scorer agreements between the investigator and the two judges were calculated on the basis of the Arrington formula (1930) reported by Feifel and Lorge (1950, p. 5):

$$\frac{2 \times \text{agreements}}{2 \times \text{agreements} + \text{disagreements}}$$

The overall percentages of agreement for the nine tasks were as follows:

Investigator and first judge - 84.0%

Investigator and second judge - 89.1%

First judge and second judge - 83.5%

Areas of disagreement were examined. These areas were the definitions of the categories "cause," "contexts in which known," and "connotation" by one judge and the definitions of "action upon" and "function" by the other judge.

The five definitions were refined through discussions with a professor of language arts. Using the refined definitions, all major problem areas were submitted to another competent and independent judge. The inter-rater agreement between this judge and the investigator was 93.5%. Application of the last judge's

decisions to the total data resulted in the following averages of agreement:

Investigator and first judge - 94.1%

Investigator and second judge - 96.6%

On the basis of the investigator's additional experience and the last judge's decisions, all scoring of the total data was reviewed. The revised data were used in determining the findings of the study which are based on the pooled individual responses to Tasks 1, 2, 3, and 4. In addition, group responses to Task 1 are compared with pooled individual responses to Task 1.

V. SUMMARY

This study was designed to determine characteristics of elementary school children's word meaning and to compare and contrast these characteristics at different age levels. Chapter III began with the considerations in the selection of the sample: location, variables, and distribution. This was followed by an outline of the instrumentation employed in determining the Ss' intelligence ratings and eliciting their oral language. Procedures for gathering the data led into the analysis of the data and the plans that were implemented in establishing the criteria for analysis, applying the criteria in the methods of analysis, and obtaining validity and reliability of the analysis. Periodic references were made to the pilot study. Treatment of the data for this

study was descriptive.

CHAPTER IV

FINDINGS OF THE STUDY

This study focussed on the characteristics of word meaning expressed by children at four different age levels in the elementary school. The Ss were asked to respond to (tell all they could about) four tasks, three tasks designed for open-ended responses and one task designed for controlled responses. Each of the first three tasks required Ss' responses to six stimuli. Characteristics of word meaning, as expressed in the categories of meaning and criterial properties contained in the Ss' responses, were investigated. The fourth task, a series of direct questions, was used to supplement the findings from the first three tasks.

The chapter contains the findings based on responses to the stimuli in the four tasks. The characteristics of the sample used in the study are reviewed, followed by a statement of the number of Ss who were able to respond to the stimuli in the tasks. Quantity of criterial properties and categories of meaning are reported under the heading "Criterial Properties Observed and Labelled Within Each Category of Meaning." Quality of word meaning is discussed under the following headings: Part Four "Refinement of Labels for Any Criterial Property"; Part

Five--"Repertoire of Expressions Available to Express Ideas"; Part Six--"Refinement of Critical Attributes that Define Classes"; and Part Seven--"Application of Word to More Objects, in More Contexts, in More Times, from More Points of View."

I. CHARACTERISTICS OF THE SAMPLE

The sample was selected with regard to some factors important in obtaining a representative sample of language. The Ss were:

1. residents of a suburban community considered to be representative of middle socio-economic status;
2. distributed equally in four age groups: 6 years to 6 years 6 months; 7 years to 7 years 6 months; 9 years to 9 years 6 months; 11 years to 11 years 6 months;
3. currently in the first, second, fourth or sixth years of school;
4. rated in intelligence between the scores of 100 to 115 on Canadian adaptations of intelligence tests constructed by R. L. Thorndike, E. Hagen, and I. Lorge;
5. considered average language users by their language arts teachers; and
6. drawn from three schools and from three or more classrooms within each school.

In addition, the selected sample had equal numbers of boys and girls.

Eight Ss, four boys and four girls, at each age level

were asked to respond individually to all tasks. Their responses were analyzed and then pooled at each age level for reporting purposes. The results were supplemented with the Ss' replies to a number of direct questions. In addition, two groups of four Ss at each age level responded to Task 1: response to verbal stimuli. Since all findings are reported on the basis of pooled responses from a number of individuals, it is not possible to trace the responses of a single child in the reported findings.

II. MEMBERS OF THE SAMPLE RESPONDING TO THE TASKS

In the first three tasks, the Ss were asked to tell all they could about each of eighteen different stimuli. The number of individuals who were unable to respond to specific stimuli is reported in Table 4.1. All individuals responded to the stimuli with concrete referents (e.g., "table," "horse," "orange," "ruler," "seagull," and "dog"). In addition, some stimuli representing more abstract referents, but still within the direct experience of the Ss (e.g., "holiday," "song," "game," "prize," and "job"), elicited responses in all age groups. Some Ss in the six-year and seven-year-old age groups failed to respond to other more abstract stimuli (e.g., "pollution," "anniversary," "illness," "education," and "poverty"). It is possible, of course, that the Ss possessed some understanding of these referents but could not express their insight.

TABLE 4.1

NUMBER OF INDIVIDUALS IN EACH AGE GROUP NOT ABLE TO RESPOND TO THE STIMULI (N=8)

Task	Stimulus	Chronological Age in Years			
		6	7	9	11
Task 1:	Verbal				
	Table				
	Pollution	2			
	Anniversary	2	1		
	Horse				
	Illness	2	1		
	Holiday				
Task 2:	Real and/or vicarious experiences				
	Orange				
	Song				
	Nervousness		1		
	Ruler				
	Game				
	Happiness		1		
Task 3:	Visual representations				
	Seagull				
	Prize				
	Education	1	1		
	Dog				
	Job				
	Poverty	3	4	1	1

In Tasks 2 and 3, real and/or vicarious experiences and visual representations, the Ss responded to more stimuli than did Ss in Task 1. Because of the abstract nature of verbal stimuli, the S may have been unable to link his knowledge with the stimulus. For example, when asked to tell all they could about "poverty," some of the Ss replied, "I don't know anything about that." However, when asked to look at the pictures depicting "poverty" and to tell what they thought it meant, some of the Ss suggested "lack of food," "disease," and "ragged clothes" as part of "poverty." The abstract symbol was unfamiliar to the Ss. The concrete representation of the picture, however, assisted in eliciting the Ss' knowledge of the specific attributes of the referent.

Task 2, real and/or vicarious experiences, generated the greatest number of individual responses to stimuli. Provision of experience appeared to help bridge the gap between language competence (knowledge of language) and language performance (expression of language knowledge). Both responses and lack of responses are considered in the findings.

III. CRITERIAL PROPERTIES OBSERVED AND LABELLED WITHIN EACH CATEGORY OF MEANING

Part III considers two dimensions of the structure of word meaning: criterial properties and categories of meaning. Criterial properties, the attributes that define an object or event, can be grouped under categories of

meaning (e.g., "black," "brown," and "chestnut" grouped under the category "color"). Tables 4.2 to 4.7 list nineteen categories of meaning and report the total numbers of times individuals observed and labelled criterial properties within each category of meaning for each task. For example, eight eleven-year-old Ss gave twenty labels for the "shape" of "table." Since the criterial property "square" was used four times, four points (out of 20) were counted. Other labels (e.g., "round," "hexagon," "triangle") made up the remaining fourteen points.

In the tables, rectangular frames emphasize the categories where there was an increase in number of criterial properties across the age levels. Also, patterns which showed a slight decrease in number at age seven to eleven years are framed. Instances where the criterial properties increased and reached the highest number at other than age eleven are marked with an asterisk. The unframed categories indicate a lack of consistent pattern. The patterns are summarized in Table 4.8 and Figures 4.1, 4.2 and 4.3.

Identification of Categories of Meaning

The patterns revealed in Tables 4.2 to 4.7 should be interpreted with the understanding that omissions of categories of meaning may have resulted from any one of the following factors: (1) not applicable to the stimulus, (2) lack of Ss' ability to recognize or label the

category, or (3) omission of the category through Ss' oversight.

Certain categories were available in some of the stimuli but were not produced (e.g., "weight" of "horse"). The omission may have been the result of the abstract nature of the oral mode. It may be conjectured that immediate experience with horses might have encouraged the Ss to talk about "weight" and "smell" of the referent. The Ss, generally, in one or more of the age levels, identified the available categories of meaning for each of the verbal stimuli (e.g., "shape" for "table," but not "cause" and "sound").

For certain stimuli in Task 1, six categories were not used at age six years but emerged at age seven and continued in the two subsequent age groups. These categories were: (1) "smell" for "pollution," (2) "where located" for "horse," (3) "part-whole" for "illness," (4) "action of" for "illness," (5) "use/function" for "holiday," and (6) "class name and others of the same class" for "holiday."

In Task 2, the Ss were encouraged to use their senses in exploring the stimuli (e.g., taste an orange) before responding to the investigator's questions. Two concrete stimuli, "orange" and "ruler," elicited all possible categories in at least one of the age groups. At the concrete-abstract level, all the categories that could be expected for "song" were used. However, the Ss

TABLE 4.2

TOTAL CRITERIAL PROPERTIES OBSERVED AND LABELLED WITHIN EACH CATEGORY OF MEANING BY POOLED INDIVIDUALS IN RESPONSE TO VERBAL STIMULI

Category of Meaning	STIMULUS: table				pollution				anniversary			
	Chronological Age in Years: 6	7	9	11	6	7	9	11	6	7	9	11
Color	14	6	17	8	2	1	8*	6				
Shape	10	7	12	20			1					
Size/Length	6	4	8	8			1			2		
Texture			1	1								
Weight								1				
Taste												
Smell						2	2	5				
Sound								1				
Action of					3	8	7	10	4	3	5	8
Action upon	5	3	8	8	1	3	2	12				
Qualities	3	2	1	5	2	4	3	11	1			
Use/function	12	10	28*	16					1	1	10*	9
Part-whole	8	9	20	21	12	8	14	22	7	11	20	21
Composition	12	8	12	21								
Where located	1		9	13	2	4	6	13				
Cause					10	3	15	22				
Class name & others of the same class	4	7	4	24				11	4	1	5	14
Connotation		1			1	3	1	2	2	4*	2	2
Variety of contexts	1	1	7	11	2	2	5	14	2	1	5	10

*An asterisk indicates a pattern in which the largest number of criterial properties occurred at an age earlier than eleven.

TABLE 4.3

TOTAL CRITERIAL PROPERTIES OBSERVED AND LABELLED WITHIN EACH CATEGORY OF MEANING BY POOLED INDIVIDUALS IN RESPONSE TO VERBAL STIMULI

Category of Meaning	STIMULUS: horse				illness				holiday			
	Chronological Age in Years: 6	7	9	11	6	7	9	11	6	7	9	11
Color	23	18	25	34								
Shape			4	7								
Size/Length	2	5	8	11			4					
Texture	1	4*	2	2					1	2	5	7
Weight												
Taste												
Smell												
Sound	1	3	4*	2								
Action of	17	15	29*	19		7	7	11	18	14	13	19
Action upon	2	1	7	11	6	12	5	11				
Qualities	5	4	4	5			3	2			1	1
Use/function	11	7	17	23						2	4	8
Part-whole	11	21	38	66		2	9	25	10	15	14	17
Composition												
Where located		7	17*	16				1			1	8
Cause					2		9*	5				
Class name & others of same class	8	7	29	49	11	7	28	42			9*	5	2
Connotation			4	8	7*	3	4	5	2	3	7	9
Variety of contexts	5	6	5	25	2	4	7*	4	11	22	30	33

*An asterisk indicates a pattern in which the largest number of criterial properties occurred at an age earlier than eleven.

TABLE 4.4

TOTAL CRITERIAL PROPERTIES OBSERVED AND LABELLED WITHIN EACH CATEGORY OF MEANING BY POOLED INDIVIDUALS IN RESPONSE TO REAL AND/OR VICARIOUS EXPERIENCES

Category of Meaning	STIMULUS: orange				song				nervousness			
	Chronological Age in Years: 6	7	9	11	6	7	9	11	6	7	9	11
Color	5	7	11*	10								
Shape	4	2	8*	5								
Size/Length		3	3	8		2*	2*					
Texture	4	3	5*	2								
Weight	2		1									
Taste	8	8	15*	6								
Smell	1	4	2	4								
Sound						3	6*	1				
Action of	2	3	2	3					2	1	8	8
Action upon	10	6	12*	10	12	15	20*	19				
Qualities	4	2	6	6			3	4				
Use/function	2	5	6*	1			3	3				
Part-whole	17	20	25*	21	3	9	19	29			2	3
Composition	1											1
Where located		3	12	19		4*	4*					
Cause							1		4	6	12*	11
Class name & others of the same class	3	6	15	17	5	13	14	25			1	1
Connotation	5	1		3	1	8	9	17	6	6	10	11
Variety of contexts	4	2	4	8	8	8	12*	3	3	5	9*	6

*An asterisk indicates a pattern in which the largest number of criterial properties occurred at an age earlier than eleven.

TABLE 4.5

TOTAL CRITERIAL PROPERTIES OBSERVED AND LABELLED WITHIN EACH CATEGORY OF MEANING BY POOLED INDIVIDUALS IN RESPONSE TO REAL AND/OR VICARIOUS EXPERIENCES

Category of Meaning	STIMULUS: ruler				game				happiness			
	Chronological Age in Years											
	6	7	9	11	6	7	9	11	6	7	9	11
Color	1	1	3	9			1					
Shape	1	2	8*	6			2					
Size/Length	4	13	12	20		2	6*	4				
Texture	1	2	5*									
Weight				2								
Taste												
Smell		1										
Sound												
Action of		1			9	14	15	16		1	10*	2
Action upon			4*	1	1	2	4	4				
Qualities	1		2	5	3		1	3				
Use/function	10	10	18	19	2	2	3	3				
Part-whole	9	17	27*	26	1	2	12*	9	12*	6	7	19*
Composition	12	16	21*	19				4				
Where located	1	1	3	8			5	6				
Cause										2	11	11
Class name & others of the same class		4	3	6	25*	21	23	38*				1
Connotation				1	5*	3	6	8*	7	10	10	11
Variety of contexts	1	1	2	2	2	4*	2		6*	3	10*	3

*An asterisk indicates a pattern in which the largest number of criterial properties occurred at an age earlier than eleven.

TABLE 4.6

TOTAL CRITERIAL PROPERTIES OBSERVED AND LABELLED WITHIN EACH CATEGORY OF MEANING BY POOLED INDIVIDUALS IN RESPONSE TO VISUAL REPRESENTATIONS

Category of Meaning	STIMULUS: seagull				prize				education			
	Chronological Age in Years: 6	7	9	11	6	7	9	11	6	7	9	11
Color	9	9	13	13		1	12*	1				
Shape		2	1	2		2		1				
Size/Length		5	6*	4		2	5*	1			1	
Texture		2		1								
Weight		1				2						
Taste												
Smell												
Sound	1	1		2								
Action of	20	26	30	32					8	14	22*	16
Action upon	3	1	1		6	9	10*	8				
Qualities	1	3*		1			1					
Use/function		1	1		1			3			4	5
Part-whole	13	18	20	28					4	9	15	29
Composition							4					
Where located	11	17	21*	14	1	1	5	11	2	1	2	20
Cause							4*	2			1	
Class name & others of same class	1	1	10	11	23	25	33	33				1
Connotation		1	1	1		1	3*	1	2	2	7*	2
Variety of contexts			2	7	8	8	19*	14	6	4	10	18

*An asterisk indicates a pattern in which the largest number of criterial properties occurred at an age earlier than eleven.

TABLE 4.7

TOTAL CRITERIAL PROPERTIES OBSERVED AND LABELLED WITHIN EACH CATEGORY OF MEANING BY POOLED INDIVIDUALS IN RESPONSE TO VISUAL REPRESENTATIONS

Category of Meaning	STIMULUS: dog				job				poverty			
	Chronological Age in Years: 6	7	9	11	6	7	9	11	6	7	9	11
Color	12	20	21*	16								
Shape		2	2	4								
Size/Length	2	9	14	15		1		2				
Texture		6*	4	5								
Weight		1										
Taste												
Smell												
Sound	4	1	9*	8								
Action of	24	28*	16	25	22*	20	12	18	1	3	1	6
Action upon	1	3	8	8		1				3	4	4
Qualities	3	7	12*	3	4	6*	4	1	5	13*	12	11
Use/function	2	4	18*	16		2	4	8				
Part-whole	7	34*	31	37*	2	3	2	5	2	2	7*	2
Composition												
Where located	1	4*	3	6*	3	6	13*	12	1	1	5	6
Cause											2	2
Class name & others of the same class	5	32	36	48	1	8	27	37				
Connotation	2	3	6	6		1	7*	4	2	1	4*	2
Variety of contexts	3	2	12*	7	11*	7	11*	4	1		10*	2

*An asterisk indicates a pattern in which the largest number of criterial properties occurred at an age earlier than eleven.

did not employ three possible categories for the concrete nature of "game": "texture," "weight," and "sound." Although specific criterial attributes of "nervousness" and "happiness" were produced, only two Ss attached a class name to the word "nervousness." One S attached a class name to "happiness." Seven categories of meaning which were not evident at age six years appeared at ages seven nine, and eleven.

The responses to the visual representations suggested an awareness of categories of meaning similar to the findings resulting from Tasks 1 and 2. All categories of meaning relative to stimuli with concrete referents, "dog" and "seagull," emerged during one or more of the age levels. The Ss omitted four categories associated with the concrete dimensions of "prize": "texture," "taste," "smell," and "sound." Only two of the expected categories of meaning for referents at the abstract end of the stimulus continuum did not appear; "class name" for "poverty" and "qualities" for "education." Eleven categories of meaning not evident at age six appeared at ages seven, nine, and eleven.

Distribution of Categories of Meaning

Findings suggested an overall increase in number of criterial properties labelled across the four age levels from six to eleven years (Table 4.8). The stimuli from Task 1 generated responses containing a

TABLE 4.8

DISTRIBUTION OF CATEGORIES OF MEANING ACCORDING TO CRITERIAL PROPERTIES OBSERVED AND LABELLED

Task	Stimulus	Number of Categories of Meaning				
		Consistent increase in the number of criterial properties from 6 years to 11 years	Greatest number of criterial properties labelled at age			No pattern in number of criterial properties
			6 yrs.	7 yrs.	9 yrs.	
1	table	9	1	-	1	3
	pollution	9	-	-	1	4
	anniversary	4	-	1	1	2
	horse	7	1	1	3	2
	illness	3	-	-	2	4
	holiday	6	1	-	-	1
2	orange	5	-	-	7	4
	song	5	-	2	3	2
	nervousness	4	-	-	2	1
	ruler	7	-	-	5	2
	game	4	2	1	2	4
	happiness	2	3	-	-	-
3	seagull	5	1	1	2	6
	prize	2	-	-	6	4
	education	4	-	-	2	3
	job	4	-	3	4	1
	dog	2	2	1	2	3
	poverty	3	-	1	3	1

consistent increase in the number of criterial properties across the four age levels in the majority of cases with the greatest number occurring at age eleven. However, when the stimuli were presented as experiences (Task 2) or visual representations (Task 3), there was a tendency for the greatest number of criterial properties to be labelled at age nine years. When the Ss were provided with experiences or visual representations, it may be that all possible properties were labelled at age nine, thus leaving no additional properties to be identified at age eleven.

Total Number of Criterial Properties Identified by All Individuals

Figures 4.1, 4.2, and 4.3 show graphically the number of pooled criterial properties identified by all Ss in response to three tasks: verbal stimuli, real and/or vicarious experiences, and visual representations. Figure 4.1 shows a consistently increasing number of criterial properties from one age group to another in five of the six verbal stimuli. For the word "table," the pattern was broken when the score for the six-year-old Ss exceeded the score for the seven-year-old Ss. In the second task (Figure 4.2), the consistent pattern of growth was maintained in three of the six experiences. In "orange," "nervousness," and "happiness," the two older age groups still exceeded the two younger age groups in number of criterial properties. In the third task (Figure 4.3),

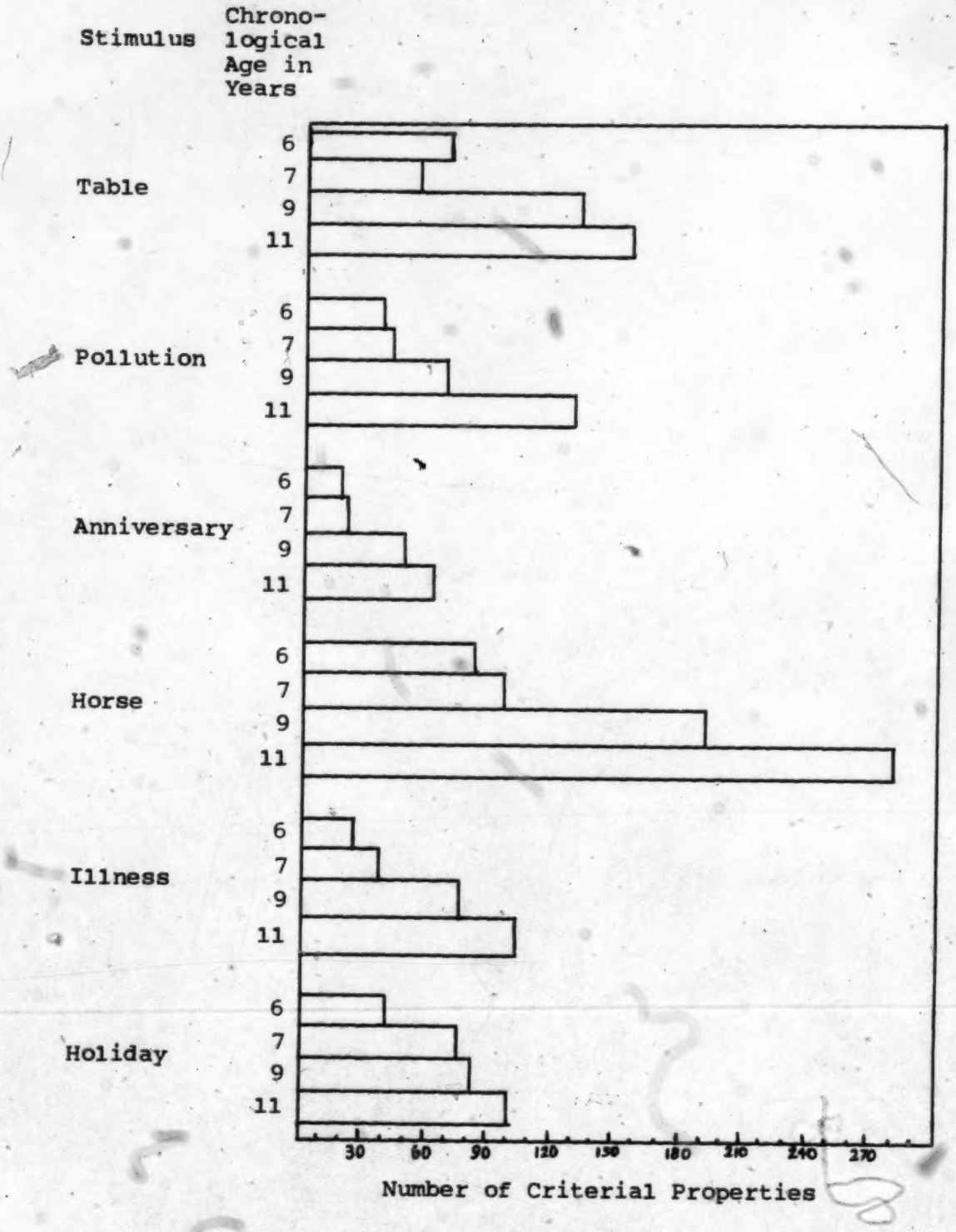


FIGURE 4.1

NUMBER OF POOLED CRITERIAL PROPERTIES IDENTIFIED BY INDIVIDUALS IN EACH AGE GROUP IN RESPONSE TO VERBAL STIMULI

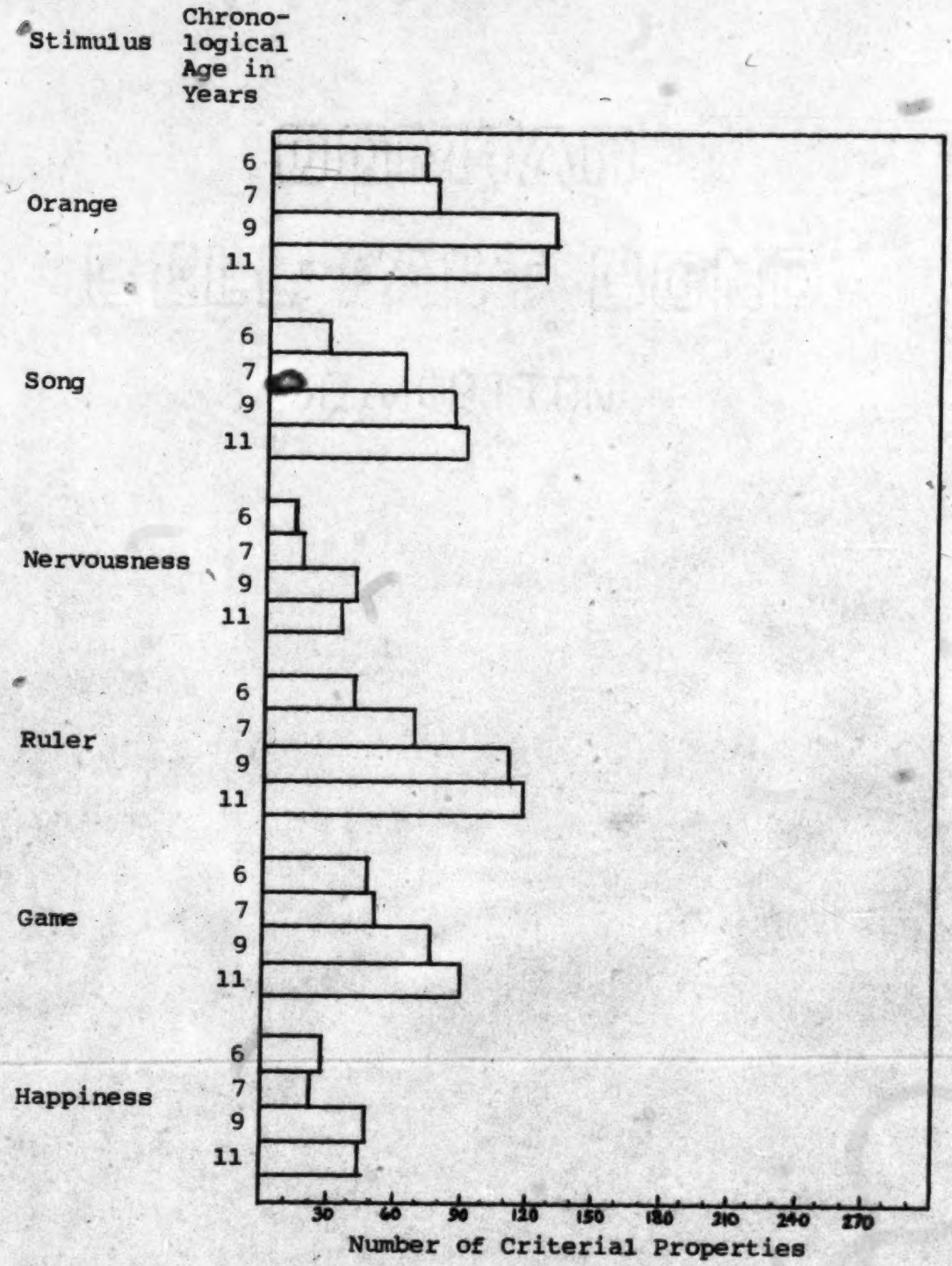


FIGURE 4.2

NUMBER OF POOLED CRITERIAL PROPERTIES IDENTIFIED BY INDIVIDUALS IN EACH AGE GROUP IN RESPONSE TO REAL AND/OR VICARIOUS EXPERIENCES

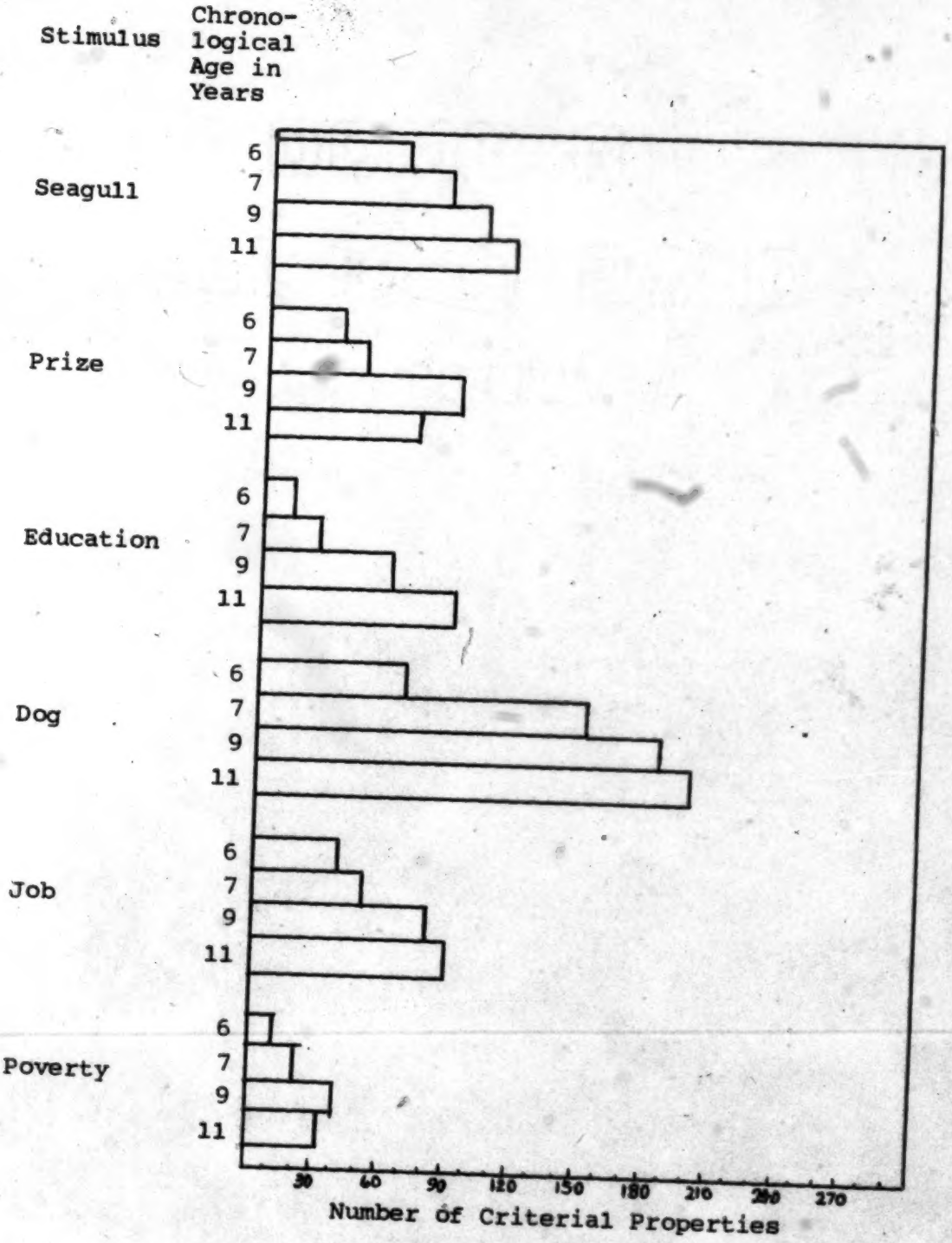


FIGURE 4.3

NUMBER OF POOLED CRITERIAL PROPERTIES IDENTIFIED BY INDIVIDUALS IN EACH AGE GROUP IN RESPONSE TO VISUAL REPRESENTATIONS

a consistent increase in number of criterial properties was revealed in four instances out of six. In "prize" and "property," the greatest number of criterial properties was labelled at age nine years and receded slightly in number at age eleven.

Comparing responses for the three tasks, the verbal stimuli generated a greater quantity of criterial properties than did either of the other two tasks for the majority of the age groups in the majority of the stimuli. Possibly, the abstract nature of the task, the verbal stimuli, allowed for more divergent and open-ended responses. The concrete nature of actual experiences and visual representations may have contributed to convergence on specific, observable attributes.

Illustrations of Increasing Number of Criterial Properties

Selected illustrations of increasing number of criterial properties observed and labelled are provided in Tables 4.9, 4.10, and 4.11. In the four categories reported for the task "table," groups and individuals revealed similar trends toward increased quantity of criterial properties across the four age groups. The illustrations in Table 4.10 suggest that labels for criterial properties increase in number according to age and may reach a maximum number at an age earlier than eleven years (e.g., age nine years). However, the preciseness of "tangy" and "tart" at age eleven years then

TABLE 4.9

ILLUSTRATIONS OF INCREASING NUMBER OF CRITERIAL PROPERTIES OBSERVED AND LABELLED FOR "TABLE"

Pooled Subjects	Category of Meaning	Chronological Age in Years			
		6	7	9	11
Groups	shape	round; square	round; square; rectangle	square; rectangle; round corners; different shapes	different shapes; round; diamond shapes; half moon; hexagon; circles; squares; octagon; triangles; rectangles; right angle corners
Individuals	shape	rectangle; square; circle; round; triangle	round; square	oval; round; square; rectangle; all sorts of shapes	round; square; triangle; rectangle; sharp corners; all types of shapes
Groups	composition	wood; steel	wood; steel	wood; steel; metal; glass; marble; velvet	teakwood; steel; tin; plastic; stone; metal; glass; acrylics

TABLE 4.9 (continued)

Pooled Subjects	Category of Meaning	Chronological Age in Years 6	7	9	11
Individuals	composition	steel; metal; leather; some kind of wood	metal; wooden; acrylic	wooden; all kinds of wood; steel; glass	wood; steel; tile; plastic; metal; marble; glass; iron; solid acrylics
Groups	class name and others of the same class	different kinds like tennis	desk; coffee table; end table; pool table	dining room table; coffee table; kitchen table; tennis table; game table; pool table; picnic table; antique table	desk; different kinds; card tables; fold-up ones; coffee tables; picnic table; patio table
Individuals	class name and others of the same class	coffee table; TV table; lamp table; stereo table	lots of kinds; shuffle board tables; pool tables; coffee tables; counter tables	all kinds of tables; office table; lunch table; work table	desks; gambling tables; pool tables; picnic table; coffee table; end table; night table; operating tables; tables on wheels; ping pong table; dinner table; card table; kitchen table; bedside table; trays; different kinds

TABLE 4.10

ILLUSTRATIONS OF INCREASING NUMBER OF CRITERIAL PROPERTIES OBSERVED AND LABELLED BY INDIVIDUALS IN RESPONSE TO REAL AND/OR VICARIOUS EXPERIENCES

Stimulus	Category of Meaning	Chronological Age in Years 6	7	9	11
orange	taste	sour; tasty; sweet	taste good; taste juicy; sour; sweet	good taste; taste sort of watery; sort of bitter; sort of good; sweet; delicious; very good; sour; rotten; juicy	good; very tasty; very tangy; tart; sweet
song	class name and others of the same class	all different songs (named some songs)	different kinds of songs; different tunes; different names; songs by me; wedding songs; goodbye songs (named some songs)	all kinds of songs; old-fashioned songs; rock 'n roll; folk songs; religious songs; hymns; national anthems; sonnet; jazz; country waltz (no songs named)	songs for kids; for parents; many different kinds; western; popular; old; rock; jazz; country; lullabies; jazz; folk; polkas; waltzes; (no songs named)
ruler	class name and others of the same class	———	different kinds; yard-sticks	tapes; yard-stick; foot ruler	yardstick; tape measures; different kinds of rulers; protractor

TABLE 4.11

ILLUSTRATIONS OF INCREASING NUMBER OF CRITERIAL PROPERTIES OBSERVED AND LABELLED BY INDIVIDUALS IN RESPONSE TO A VISUAL REPRESENTATION OF "DOG"

Stimulus	Category of Meaning	Chronological Age in Years 6	7	9	11
dog	sound	bark; barking sound	bark	bark; yelp; yap; howl;	bark; howl
dog	texture	_____	some are furrier than others; furry; fluffy; bushy (tails)	curly; hairy; bushy (tails)	curly; furry; straggly; bushy (tails)
dog	class name and others of the same class	bulldogs; babies; police dogs; wolves	pups; cats; different kinds (8 named); wolf family; animal; mammal	carnivore; pups; different kinds; certain breeds (13 named); wolf; animals; mammals	wolf; coyote; puppies; something like horses; different kinds (16 named); animals

assumes importance. The Ss did not label "class name and others of the same class" for "ruler" until age seven, but maintained a small but steady increase in criterial properties at ages nine and eleven.

Three categories of meaning for "dog" suggested three variations of an increase in criterial properties across the age levels. Ss of age nine gave the most labels for "sound"; ages seven, nine and eleven for "class name and others of the same class." It is possible that the personal experiences young children have with dogs may have enabled them to talk about them at an earlier time.

Number of Different Categories of Meaning Identified

To determine some part of the depth of the Ss' word meaning, the total number of categories of meaning identified by the Ss at each level for each task was examined (Table 4.12). Framed categories indicate a general increase in number of categories across the age levels. The asterisks in the unframed categories point out ages in which the largest number of categories was identified at an age other than eleven years.

In response to the verbal stimuli (Task 1), there was a steady increase in the use of different categories of meaning from one age level to another five times out of six. Only two stimuli in each of Tasks 2 and 3 indicated a gradual increase in number of categories of meaning. These four stimuli were representative of

TABLE 4.12

TOTAL NUMBER OF DIFFERENT CATEGORIES OF MEANING IDENTIFIED BY THE SUBJECTS AT EACH AGE LEVEL IN RESPONSE TO EACH STIMULUS

Task		Stimulus	Chronological Age in Years 6	7	9	11
Task 1:	Verbal	Table	11	11	12	12
		Pollution	9	10	12	13
		Anniversary	7*[b]	7	6	6
		Horse	11	12	14	14
		Illness	5	6	9	9
		Holiday	5	7	9	9
Task 2:	Real and/or Vicarious Experiences	Orange	15*	15	15	15
		Song	5	8	11*	8
		Nervousness	4	4	6	7
		Ruler	10	12	12	12
		Game	8	8	12*	10
		Happiness	3	6*	6	5
Task 3:	Visual Representations	Seagull	8	14*	11	12
		Prize	5	9	10	10
		Education	5	5	8*	7
		Dog	12	15*	14	15
		Job	6	10*	8	9
		Poverty	6	6	8	8

[a] Categories enclosed in a rectangle indicate a general increase in number across age levels.

[b] An asterisk indicates a pattern in which the largest number of categories occurs at an age earlier than eleven.

concrete, concrete-abstract, and abstract points on a concrete to abstract continuum. In Tasks 2 and 3, experiences and visual representations, the largest number of categories was identified in response to one stimulus at age six years, four stimuli at age seven years, and three stimuli at age nine years. The question is whether the abstract nature of the verbal stimuli in Task 1 was less restricting for production of ideas, or whether the concrete nature of the experiences and visual representations in Tasks 2 and 3 assisted the Ss in identifying categories of meaning at an earlier age.

In those instances where the largest number of categories of meaning used was quite small (e.g., 6, 7, or 8), a growth potential for all ages may exist.

Number and Illustrations of Multiple Word Meanings

Russell (1954) referred to three types of knowledge a child may have for a word: (1) breadth of vocabulary or number of different words known, (2) height of vocabulary knowledge in the alternate meanings for a single word, and (3) depth of meaning in "the nature of the meaning that children possess for a word" (Jackson, 1970a). Counts of criterial properties and categories of meaning reveal something of the depth of a Ss' word meaning. However, it seemed that an examination of the multiple meanings a S possesses for a word would provide an additional dimension of both his height

and breadth of vocabulary knowledge. Multiple meanings include both the meanings related to an original stimulus (e.g., "horse meat") and the meanings not related to the original one given in the stimulus (e.g., "hoarse throat").

Related meanings were produced in the main text of the Ss' replies to the statement: "Tell me all you can about (stimulus given)"; and also in response to the question: "Are there any other ways the word (stimulus given) can be used which are different from the meanings you have given already?" The unrelated, but accepted, meanings generally occurred after the probe question and gave some indication of other meanings for a word in another context.

A summary of the total number of multiple word meanings identified by individuals at four age levels in response to the stimuli in the three tasks is provided in Table 4.13. Illustrations of the multiple word meanings produced by individuals and by groups in response to stimuli from Task 1 are given in Table 4.14.

Two responses considered to be related word meanings appeared at age six years; the number increased at age seven years. In addition, at ages six and seven, meanings not related to the original meaning were noted (e.g., "weather tables" and "times tables" relative to the task "table").

In the ten stimuli which generated multiple word meanings, there was a marked increase at age nine years

TABLE 4.13

TOTAL NUMBER OF MULTIPLE WORD MEANINGS IDENTIFIED BY INDIVIDUALS

Task	Stimulus		Pooled Individuals: Chronological Age in Years 6	7	9	11
Task 1: Verbal	Table	a			4	4
		b		1	7	5
	Horse	a	1	2	4	3
		b			5	3
	Holiday	a			1	4
		b			1	1
Task 2: Real and/or vicarious experiences	Orange	a		4	7	11
		b			1	
	Nervousness	a			1	
		b				
	Ruler	a				
		b		3	8	7
	Game	a			4	4
		b				
Task 3: Visual representations	Seagull	a			1	
		b				
	Prize	a			3	7
		b				
	Dog	a	1	3	7	4
		b			2	2

[a]meaning related to the original meaning given in response to the stimulus, e.g., tablecloth

[b]meaning not related to the original meaning given in response to the stimulus, e.g., division tables

No multiple word meanings were identified in response to the following stimuli: pollution, song, education, anniversary, happiness, job, illness, poverty

TABLE 4.14

EXAMPLES OF MULTIPLE MEANINGS SUPPLIED BY INDIVIDUALS AND BY GROUPS IN RESPONSE TO VERBAL STIMULI

Stimulus	Chronological Age in Years	Type of Response	Pooled Groups	Pooled Individuals
Table	6	a		
		b		
	7	a		
		b	times tables	in math.
	9	a		
		b	times tables	tablespoons; table mats; table tennis; table cover
				arithmetic tables; times tables; weather tables; tables that measure; all sorts of mathematics tables
	11	a	tablespoons; table manners; table lamp; tablecloth	tablecloth; table tennis; table mats
		b	table of contents; times tables	times table; time table (teaching schedule)
Holiday	6	a		
		b		

[a]meanings related to original response

[b]meanings not related to original response

TABLE 4.14 (continued)

Stimulus	Chronological Age in Years	Type of Response	Pooled Groups	Pooled Individuals
Holiday (continued)	7	a		
		b		Holiday Inn
	9	a	Holiday Inn; Holiday trailer	Holiday trailer
		b		friend . . . last name is Holiday
	11	a	Holiday Inn; holiday trip; holy day (origin); holiday pack	Holiday Inn; Roman Holiday (jewellery); as a last name
Horse	6	a	a toy horse; electric horse with a motor	title of a story, A Horse and a Man
		b		
	7	a	horseshoe; horse meat; box horse, seahorse; toy horse	toy horse; name a person a monkey horse
	9	a	horsing around; cars called Pinto and Mustang; toy horses; horsefly; saw-horse	horsefly; horse shoe; horse race; you horse (expression)
		b	hoarse voice	hoarse throats . . . real strong voice; horseradish

TABLE 4.14 (continued)

Stimulus	Chronological Age in Years	Type of Response	Pooled Groups	Pooled Individuals
Horse (continued)	11	a	horse trade; horse shoe (game); pin the tail on the donkey; horse play; horse around; eats like a horse; horsefly; seahorse; horsewhip; horseback riding	horsefly; eat like a horse; horseless carriage
		b	very hoarse throat	kind of a foggy voice; hoarse voice

in both related meanings and unrelated meanings except in response to three stimuli: "holiday," "nervousness," and "seagull." There was no overall pattern of continuing increase or decrease at age eleven years. Instead, the pattern fluctuated in response to various stimuli along the concrete to abstract continuum.

A comparison of the examples of related and unrelated word meanings given by groups and individuals, for Task 1 only, showed that Ss in a group context produced a greater number of related meanings for the two stimuli, "holiday" and "horse." This pattern did not occur in "table" or relative to unrelated meanings. Pooled responses were slightly higher for unrelated meanings produced by individuals over unrelated word meanings produced by groups.

Comparison of Total Criterial Properties for Individuals and Groups

To investigate the influence of context upon quantity of language produced, a comparison of the total number of different criterial properties given by individuals and by groups was made. In previous tables, where only pooled individual responses were recorded, the responses represented the total number of criterial properties given by all individuals. However, in comparing pooled group and pooled individual responses, only the different criterial properties are recorded. For example, in making comparisons, "square" would be counted once for

"shape" of "table" for pooled individuals even though it was given by each of the five Ss.

The summary in Tables 4.15 to 4.20 suggested that, overall, a greater number of specifics was produced by pooled individuals than by pooled groups. Comparing the total number of different criterial properties for each stimulus in Task 1, pooled individuals exceeded pooled groups every time. The differences ranged from five totals for "illness" to twenty-three totals for "pollution."

An examination of total categories of meaning by age groups showed that pooled individuals exceeded pooled groups eighteen times out of a possible twenty-four. In the remaining six they were tied four times at ages seven years and eleven years. Pooled groups scored higher than pooled individuals in only two instances.

In the pilot study, the groups generally produced a greater number of criterial properties than did the individuals. The expectation that the groups would again exceed individuals in the present study was not realized. This time the Ss were more productive in terms of specific properties when interviewed alone. The groups in the pilot study represented Ss with intelligence ratings up to 117. In addition, the intelligence ratings were based on different intelligence tests. The higher ratings may have resulted in more stimulation of peers in the group context.

TABLE 4.15

COMPARISON OF POOLED GROUP RESPONSES AND POOLED INDIVIDUAL RESPONSES FOR DIFFERENT CRITERIAL PROPERTIES WITHIN EACH CATEGORY OF MEANING IN RESPONSE TO THE STIMULUS "TABLE"

Category of Meaning	Pooled Groups				Pooled Individuals			
	Chronological Age in Years							
	6	7	9	11	6	7	9	11
Color	1	1	8	6[a]	8	6	9	4
Shape	3	3	4	11	6	4	7	8
Size/Length		2	2	3	6	3	6	7
Texture			1	2			1	1
Weight				2				
Taste								
Smell								
Sound								
Action of								
Action upon	5	2	3	9	5	3	8	7
Qualities		1		9	3	2	1	5
Use/function	5	3	4	9	4	4	14	6
Part-whole	4	6	12	10	5	3	10	11
Composition	2	2	8	9	4	3	5	9
Where located	1		6	7	1		9	10
Cause								
Class name & others of the same class	1	4	8	8	4	6	4	20
Connotation						1		
Variety of contexts		3	1	7	1	1	5	9

[a]The underlined number represents the larger number of criterial properties between pooled groups and pooled individuals for the same age level. For example, age 11 scored 6 and 4 for the category "color." 6 is underlined.

TABLE 4.16

COMPARISON OF POOLED GROUP RESPONSES AND POOLED INDIVIDUAL RESPONSES FOR DIFFERENT CRITERIAL PROPERTIES WITHIN EACH CATEGORY OF MEANING IN RESPONSE TO THE STIMULUS "POLLUTION"

Category of Meaning	Pooled Groups				Pooled Individuals			
	Chronological Age in Years							
	6	7	9	11	6	7	9	11
Color	5[a]	6	2	2	2	1	6	5
Shape							1	
Size/Length							1	
Texture								
Weight								1
Taste								
Smell	1	3	1			2	1	5
Sound								1
Action of	2	5	4	5	3	7	7	9
Action upon	2	1	2	7	1	2	2	12
Qualities	2	3	3	1	2	4	3	10
Use/function				1				
Part-whole	10	4	12	9	9	5	12	17
Composition								
Where located		3	6	9	2	4	4	12
Cause	2	5	6	10	5	3	10	14
Class name & others of the same class				9				6
Connotation					1	3	1	2
Variety of contexts		1	1	7	2	2	5	12

[a]The underlined number represents the larger number of criterial properties between pooled groups and pooled individuals for the same age level.

TABLE 4.17

COMPARISON OF POOLED GROUP RESPONSES AND POOLED INDIVIDUAL RESPONSES FOR DIFFERENT CRITERIAL PROPERTIES WITHIN EACH CATEGORY OF MEANING IN RESPONSE TO THE STIMULUS "ANNIVERSARY"

Category of Meaning	Pooled Groups				Pooled Individuals			
	Chronological Age in Years							
	6	7	9	11	6	7	9	11
Color								
Shape								
Size/Length	1[a]	2						
Texture						2		
Weight								
Taste								
Smell								
Sound								
Action of	1	7	8	6	4	3	3	3
Action upon								
Qualities					1			
Use/function		2	4	3	1	1	6	4
Part-whole	7	8	8	14	4	10	12	15
Composition								
Where located	2			3				
Cause								
Class name & others of the same class	2	3	1	7	4	1	4	11
Connotation				2	2	4	2	2
Variety of contexts	2	1	4	8	2	4	2	2

[a]The underlined number represents the larger number of criterial properties between pooled groups and pooled individuals for the same age level.

TABLE 4.18

COMPARISON OF POOLED GROUP RESPONSES AND POOLED INDIVIDUAL RESPONSES FOR DIFFERENT CRITERIAL PROPERTIES WITHIN EACH CATEGORY OF MEANING IN RESPONSE TO THE STIMULUS "HORSE"

Category of Meaning	Pooled Groups				Pooled Individuals			
	Chronological Age in Years							
	6	7	9	11	6	7	9	11
Color	6	10[a]	8	8	11	4	9	15
Shape		2	9	2			4	7
Size/Length	5	4	3	8	2	4	8	8
Texture		2			1	4	2	2
Weight	1							
Taste								
Smell			1					
Sound			2	2	1	3	4	2
Action of	7	8	16	10	9	9	16	18
Action upon	1	1	9	11	2	1	7	10
Qualities	2	3	2	9	4	4	4	5
Use/function	5	8	8	14	6	2	8	14
Part-whole	17	15	27	26	10	12	21	31
Composition								
Where located	2	5	2	2		4	12	11
Cause								
Class name & others of the same class	2	17	11	17	6	5	20	28
Connotation		2	2	4			4	7
Variety of contexts	3	5	12	8	4	3	5	18

[a]The underlined number represents the larger number of criterial properties between pooled groups and pooled individuals for the same age level.

TABLE 4.19

COMPARISON OF POOLED GROUP RESPONSES AND POOLED INDIVIDUAL RESPONSES FOR DIFFERENT CRITERIAL PROPERTIES WITHIN EACH CATEGORY OF MEANING IN RESPONSE TO THE STIMULUS "ILLNESS"

Category of Meaning	Pooled Groups				Pooled Individuals			
	Chronological Age in Years							
	6	7	9	11	6	7	9	11
Color								
Shape								
Size/Length			1	2[a]				
Texture							4	
Weight								
Taste	2			1				
Smell								
Sound			2					
Action of	1	7	7	7		7	6	9
Action upon	5		6	9	6	7	3	9
Qualities							3	2
Use/function								
Part-whole		7	5	7		1	8	16
Composition								
Where located			3	1				1
Cause		13	5	10	2		9	5
Class name & others of same class	5	12	16	17	8	7	22	20
Connotation	4	1	3	3	5	3	4	5
Variety of contexts	2	1	4	5	2	2	7	4

[a]The underlined number represents the larger number of criterial properties between pooled groups and pooled individuals for the same age level.

TABLE 4.20

COMPARISON OF POOLED GROUP RESPONSES AND POOLED INDIVIDUAL RESPONSES FOR DIFFERENT CRITERIAL PROPERTIES WITHIN EACH CATEGORY OF MEANING IN RESPONSE TO THE STIMULUS "HOLIDAY"

Category of Meaning	Pooled Groups				Pooled Individuals			
	Chronological Age in Years							
	6	7	9	11	6	7	9	11
Color								
Shape								
Size/Length			2	1	1[a]	2	5	5
Weight								
Taste								
Smell								
Sound								
Action of	3	4	6	7	13	6	7	10
Action upon								
Qualities			1	1			1	1
Use/function		4	3	4		2	4	5
Part-whole	7	5	8	14	10	13	14	16
Composition								
Where located		1	2	4			1	7
Cause								
Class name & others of same class		1	5	8		6	5	2
Connotation		1	1	4	1	1	4	8
Variety of contexts	9	10	8	9	9	14	17	21

[a]The underlined number represents the larger number of criterial properties between pooled groups and pooled individuals for the same age level.

Comparison of Total Categories of Meaning for Individuals and Groups

Another way of observing depth of word meaning was to examine the total number of categories of meaning in the individuals' and the groups' responses to the stimuli in Task 1. The Ss' labels for the criterial properties were assigned to the appropriate categories of meaning (e.g., "wood" to "composition" of "table"). The number of categories for each age group was totalled for each stimulus. Table 4.21 shows the total number of categories of meaning identified by individuals and by groups.

In the responses to four of the six stimuli, pooled individuals exceeded pooled groups in number of categories of meaning identified. Pooled groups exceeded pooled individuals in response to one stimulus "illness" and tied in response to another stimulus "horse."

Comparison of individuals and groups at each age level in each task revealed that thirteen of the possible twenty-four combinations favored pooled individuals relative to number of categories of meaning identified, six favored pooled groups with the remaining five equal. These combinations did not appear in any particular type of stimulus or age group. An increasing number of categories of meaning across the age levels was identified in response to four out of six stimuli by pooled groups and in five out of six by pooled individuals. The identification of a greater number of categories of meaning in

TABLE 4.21

COMPARISON OF NUMBER OF CATEGORIES OF MEANING IDENTIFIED IN POOLED GROUP RESPONSES AND POOLED INDIVIDUAL RESPONSES TO VERBAL STIMULI

Stimulus	Context	Chronological Age in Years 6	7	9	11	Total Categories of Meaning
Table	Groups	8	9	11	13	41
	Individuals	11	11	12	12	46
Pollution	Groups	7	9	9	9	34
	Individuals	9	10	12	13	44
Anniversary	Groups	6	6	5	7	24
	Individuals	7	7	6	6	26
Horse	Groups	11	13	14	13	51
	Individuals	11	12	14	14	51
Illness	Groups	6	6	10	11	33
	Individuals	5	6	9	9	29
Holiday	Groups	3	7	9	9	28
	Individuals	5	7	9	9	30

the pooled responses of individuals paralleled the findings given in the previous section for the identification of criterial properties.

Summary

The findings stated in Section III are summarized under six headings.

1. Identification of categories of meaning

a. A number of categories which did not emerge in the responses of the six-year-old Ss was identified at the seven-, nine-, or eleven-year-old age levels.

2. Patterns of criterial properties

a. There was evidence of an overall increase in the number of criterial properties observed and labelled across the age groups for Tasks 1, 2, and 3.

b. The pattern of increase usually reached its highest level with eleven-year-old Ss' responses to stimuli for Task 1. The pattern changed in the Ss' responses to stimuli for Tasks 2 and 3 when the highest level in the pattern of increase was reached in a number of instances by the nine-year-olds rather than the eleven-year-olds. It was suggested that this trend may have evolved as a result of the nature of the tasks.

3. Total number of criterial properties identified by individuals

a. The verbal stimuli, compared with the stimuli from the real and/or vicarious experiences and visual representations, elicited a greater number of criterial

properties for the majority of the age groups in response to the majority of stimuli.

4. Number of different categories of meaning

a. There was a gradual increase in the number of categories of meaning from the six-year-old Ss to the eleven-year-old Ss in response to verbal stimuli.

b. The maximum number of categories of meaning was reached at different age levels from six years to eleven years in response to the stimuli from Tasks 2 and 3.

5. Emergence of multiple word meanings

a. A small number of multiple word meanings emerged at ages six and seven with a sharp increase at age nine. There was no consistent pattern of either increase or decrease at age eleven.

b. Comparison of the pooled responses of groups and individuals revealed that the groups produced the greater number of related meanings in responses to two out of three stimuli. However, the individuals produced slightly more unrelated meanings.

6. Comparison of groups and individuals in number of criterial properties labelled and number of categories of meaning identified in Task 1

a. Overall, there was a greater number of criterial properties observed and labelled by individuals than by groups. This pattern occurred every time for each of the verbal stimuli.

b. The individuals produced the greater number of categories of meaning in response to the majority of the stimuli.

c. Both individuals and groups gave evidence of an increasing number of categories of meaning identified in response to the majority of the stimuli across the age levels.

IV. REFINEMENT OF LABELS FOR ANY CRITERIAL PROPERTY

In this part of the study, growth in word meaning was determined by identifying instances in which the Ss refined labels for the criterial properties of a variety of stimuli. Consideration was given also to instances in which labels were not refined.

Refinement of a label may be identified in a number of ways. First, a S may add words to those words already included in his labels for a category of meaning (e.g., addition of "trot" and "gallop" to "run"). "Run" is "run" for most children with the developing understanding that there are other ways of running which can be expressed in different words. Second, precise labels may be given as the S learns that there are more exact meanings for referents (e.g., "turquoise" as a precise label for a shade of "blue" paint). Third, shades of differences in meaning may be identified in the use of qualifiers (e.g., the adverb "light" modifying the adjective "green"). Fourth, the S may find that figures of speech (e.g., metaphor; simile)

serve to refine labels through comparison.

Some tasks did not elicit refined responses. The first three tasks, requiring Ss to tell all they could about stimuli presented in three different ways, encouraged the Ss to give open-ended responses. At no time were the Ss placed in a situation where they had to select the most relevant properties of a referent for a specific purpose. For example, to "tell about the most beautiful horse you know" might encourage a S to emphasize 'color' as "black as coal" rather than just "black." Thus, the Ss could be expected to give a broad number of criterial properties for each stimulus. Explicitness in the selection of the properties was not mandatory.

For other reasons, also, refined labels were not obtained. If a property is simple and easily labelled (e.g., the "color" of an orange; the "shape" of a circle), there is no need for further refinement of it. Ss at all four ages, therefore, identified the category of "color" of an orange as "orange." In addition, some categories of meaning are irrelevant for some stimuli (e.g., "color" of "nervousness"; "action of" a "table"). Finally, when categories of meaning are identified first at age seven (e.g., "quality" of "poverty"; "use" of "dog"), the labels still may not be refined at age eleven.

Tables 4.22 to 4.26 give the Ss' responses which showed refinement of criterial properties. All the responses which were relevant to the refinement of a

particular property are given. For example, all responses which led up to "tangy" and "tart" of "orange" (Table 4.23) were included. The irrelevant responses "juicy," "taste good," "sweet," and "very watery" were excluded.

Responses to Verbal Stimuli

In Task 1, the general trends in refinement of labels (Table 4.22) by either groups or individuals appeared to be similar. In both contexts, illustrations were most apparent for the concrete referents, "table" and "horse," and predominantly in reference to the categories of "shape," "composition," "action of," and "part-whole." The precise labelling of criterial properties varied according to age and category of meaning. For example, the "shape" of a table and the "action" of a horse were identified precisely at age nine years through such labels as "circle" and "oval," or "canter" and "gallop." The "mane" of a horse was identified at age six years and the "hooves" of a horse at age seven years. However, the "composition" of a table was not refined until age eleven years when a child used the specific label "teakwood" for the general label "wood."

Responses to Real and/or Vicarious Experiences

In Task 2, refinement of labels for concrete referents again appeared to be evident. According to the examples given in Table 4.23, "orange" and "ruler" resulted in responses indicative of an increasing

TABLE 4.22

ILLUSTRATIONS OF REFINEMENT OF LABELS BY POOLED GROUPS AND POOLED INDIVIDUALS FOR ANY CRITERIAL PROPERTIES GENERATED BY VERBAL STIMULI

Subjects	Stimulus	Category of meaning	Chronological Age in Years 6	7	9	11
Pooled groups	table	shape	round	round	round corners; different shapes; oval	different shapes; round; oval; half moon; circles
Pooled groups	table	composition	wood	wood	wood	teakwood and wood
Pooled groups	horse	action of	trot; gallop	run fast	run; trot; canter; gallop	trot; run fast; gallop
Pooled individuals	horse	action of	run fast; gallop	run fast; gallop	run; trot; canter; race; gallop	run; gallop
Pooled groups	horse	part-whole	manes	manes	manes	manes
Pooled individuals	horse	part-whole	some kind of hairs on their head; manes	manes	manes	manes

TABLE 4.22 (continued)

Subjects	Stimulus	Category of meaning	Chronological Age in Years 6	7	9	11
Pooled groups	horse	part-whole	———	hooves	hooves	hooves
Pooled individuals	horse	part-whole	———	hooves	hooves	hooves

refinement of labels. In addition, a similar pattern of refinement occurred in response to the two abstract tasks, "nervousness" and "happiness." The Ss achieved precise labels for the "taste" and "qualities" of "orange" at age eleven years but it appeared they were unable to define "smell" precisely at this age. Terms such as "kind of," "something like," and "sorta" seemed to indicate recognition of the need for a more precise label.

Ss identified the "size" and "qualities" of a ruler at first by sentences or phrases (e.g., "some are long"; "a little bit loose"). However, less language and a precise label, "yard" and "flexible," served for accurate identification at ages nine and eleven. A similar development occurred in the "part-whole" category in "ruler" when the Ss moved from "some have real close numbers" to "inches, decimeters and millimeters."

In the "action of" category for the abstract task "nervousness," the Ss employed a greater quantity of language (e.g., "face goes all red") at age six years. This expression was retained at age nine with the addition of the precise and accurate label "blush." Although the Ss moved from dogmatic statements of "angry" and "mad" to "scared" and "frightened" in the class name of "nervousness," their problems in grappling with a precise definition were evident in such terms as "kind of a scary feeling" and "sort of scared." A similar problem was exemplified in the task "happiness" as they began with

TABLE 4.23

ILLUSTRATIONS OF REFINEMENT OF LABELS BY POOLED INDIVIDUALS FOR ANY CRITERIAL PROPERTY GENERATED BY REAL AND/OR VICARIOUS EXPERIENCES

Stimulus	Category of Meaning	Chronological Age in Years 6	7	9	11
orange	taste	some oranges are sour; taste like orange	sour	sort of like an orange; sort of bitter	very tangy; tart
orange	qualities	very good for you	———	———	healthy; nutritious
orange	smell	smells nice	smell nice; lemonish smell; smell kind of like an orange	very soft smell	kind of tangy; something like soap; it smells . . . sort a hard to describe
nervousness	action of	face goes all red	———	face goes all red; blush	———
nervousness	class name & others of same class	———	———	a feeling	kind of a scary feeling
ruler	size	some are long	very big ruler; some go up to 30 or 31	big; large; up to 3 feet	yard
ruler	qualities	a little bit loose	———	flexible	flexible

TABLE 4.23 (continued)

Stimulus	Category of Meaning	Chronological Age in Years 6	7	9	11
ruler	part-whole	some numbers which you can't understand; some have real close numbers	number; inches	numbers; inches; centimeters; millimeters; decimeters; half inches	inches; decimeters; quarter inches; millimeters
happiness	connotation	you're happy; you laugh	you're glad; joyful	happy; real glad; joyful	kind of like joy; cheerful; glad

"you're happy" at age six and progressed to "cheerful," "glad," and "kind of like joy" at age eleven.

Responses to Visual Representations

The illustrations in Table 4.24 indicate the same general trends reported in Tables 4.22 and 4.23. The concrete referents, "seagull" and "dog," plus two referents not considered concrete, "prize" and "poverty," generated the most evident illustrations of refinement of labels. In three of the six categories reported, "sound" and "action of" seagulls plus the "class name" of "prize," Ss appeared to reach the highest level of refinement of labels at age eleven years. Two categories, the "use" of "dog" and the "quality" of "poverty," were expressed precisely at age nine years. The dog's "babies" were defined as "pups" by young children of seven years.

The nature of the difference in refinement of labels varied from replacement of a single word by another, but more precise, definition (e.g., "fly → soar" and "babies → pups"), to replacement of a group of words by a single label or a group of more accurate labels (e.g., "all winning things" → "souvenir, reward" and "not having good things to eat" → "starving half to death"). The sound of a seagull posed a problem as the Ss moved from making the sound to the label "quack" (generally associated with a duck) and finally stated it as "a kind of screamish noise."

TABLE 4.24

ILLUSTRATIONS OF REFINEMENT OF LABELS BY POOLED INDIVIDUALS FOR ANY CRITERIAL PROPERTY GENERATED BY VISUAL REPRESENTATIONS

Stimulus	Category of Meaning	Chronological Age in Years 6	7	9	11
seagull	sound	make some kind of noise (makes the noise)	quack	———	kind of a screamish noise
seagull	action of	fly	fly	fly	soar
prize	class name & others of same class	prize	prize; all different kinds; all winning things	prize	prize; souvenir; reward
dog	use	———	keep people safe	for protection	———
dog	class name & others of same class	babies	pups	pups	pups
poverty	quality	———	not having very good things to eat	hungry; starvation	starving half to death; you're starving

Controlled Responses

Additional evidence supporting an increasing refinement of labels for any criterial property was revealed in the Ss' responses to a number of questions designed to provide information supplementary to the responses to the first three tasks. Previously, the Ss were encouraged to tell all they could about a total of eighteen different referents. For Task 4, they were asked specific questions related to a number of different categories of meaning (e.g., "color," "shape," or "size" of specific objects). The stimuli were selected, in some instances, to provide for the expansion of criterial properties within a category of meaning (e.g., movements of a cat--"action of") and, in other instances, for the refinement of a label for the criterial property (e.g., an avocado paint sample --"color"). Since the purpose of Task 4 was to fill in the gaps in the precision of meanings from Tasks 1 and 2, and 3 only the responses which added to the findings are given. Out of the total of thirty-one stimuli in Task 4, twenty-one were applicable to the hypothesis on refinement of labels. However, only the responses from the eight stimuli which added to the findings about refinement of labels were included in the discussion (e.g., "sounds"; "smell"). The other thirteen supplied information which was available already and reported under Tasks 1, 2, and 3 (e.g., "size"; "texture"; "action of"; "qualities"; "connotation"). An additional eight stimuli did not add to the refinement of

labels but were more useful in the count of criterial properties (e.g., "parts of" a television set). Two other stimuli assisted in the definition of critical attributes that define classes (e.g., ways in which "oranges," "grapefruits," and "lemons" are all alike).

Table 4.25 summarizes the responses of all the Ss to two questions: (1) What color is this square (avocado)? (2) And this one (turquoise)? The youngest Ss answered briefly and precisely with "green" and "blue." The seven-year-olds employed modifiers (e.g., "_typish_ green"; "_light_ green") in response to the turquoise sample. One S used a phrase, "_kind of_ bluish." Five of the eight Ss at age nine years used modifiers or phrases (e.g., "greenish blue"; "sort of beige"). Five of the eleven-year-old Ss gained precision by using a new word "turquoise" for the second paint sample. The remaining three used the modifiers "blue" and "bluish." Most of the Ss in all age groups labelled the first paint sample "green."

Refinement of labels was demonstrated in the use of two additional devices, similes and metaphors. The two figures of speech were more prevalent in reference to descriptions of the pear-shaped cutout than to descriptions of the oval one. For example, all Ss of all ages used metaphors and similes a total of between six and eight times. However, neither figure of speech was used by the eleven-year-old Ss in labelling the oval figure. It appeared that the oval figure was easier to

TABLE 4.25

EIGHT Ss' RESPONSES TO TWO QUESTIONS: (a) WHAT COLOR IS THIS SQUARE? (b) AND THIS ONE?[a]

Subject Number	Chronological Age in Years 6	7	9	11
1	a. It's a triangle . . . green	a. green	a. pink	a. green
	b. lightest green	b. blue	b. blue	b. blue green
2	a. green	a. green	a. green	a. green
	b. blue	b. purple	b. blue green	b. sort of bluish green
3	a. green	a. green	a. olive green	a. green type of green, green like fir tree green
	b. I don't know, uh, blue	b. green	b. sort of beige	b. turquoise
4.	a. green	a. green	a. green	a. green
	b. blue	b. blue	b. um, greenish blue	b. blue . . . turquoise
5	a. green	a. green	a. green	a. green
	b. green	b. kind of bluish	b. um, light green	b. turquoise
6	a. green	a. green	a. green	a. green
	b. green	b. typish green	b. blue	b. bluish green
7	a. green	a. green	a. green	a. green
	b. blue	b. light green	b. uh, turquoise green	b. a turquoise . . . light turquoise

[a]The first square was an avocado paint sample; the second was a turquoise paint sample.

TABLE 4.25 (continued)

Subject Number	Chronological Age in Years 6	7	9	11
8	a. green b. blue	a. green b. green	a. green b. apple	a. green b. turquoise

TABLE 4.26

ILLUSTRATIONS OF SIMILES AND METAPHORS IN THE DESCRIPTION OF A PEAR-SHAPED CUTOUT

Figure of Speech	Chronological Age in Years			
	6	7	9	11
Simile	as a bell like like an egg as a bottle like a shoe like a pear	like a guitar like an ink bottle like a guitar shape	like a football pear-like like sort of a space capsule	like a pear like a space capsule like a pear on its side
Metaphor	footprint pear	a pear pear shape table egg shaped	pear (2 times) pear shaped	peanut-shaped egg pear shaped

identify and consequently did not cause the Ss to resort to other devices in attaching a label to it.

Ss' responses to the smell of a strong-smelling soap also suggested that the nature of the task determines to a large extent the nature of the device used to express meaning. Comparison was used twice by six-year-old Ss: "smells like night or something" and " . . . smells like Irish soap . . . ." Two examples of contrast and three examples of comparison appeared in the responses of the seven-year-olds. This device was used less by the nine-year-olds and did not appear in the responses of eleven-year-olds to this stimulus.

Illustrations of similes and metaphors used by the Ss at the four age levels in describing the pear-shaped cutout are provided in Table 4.26.

The main finding arising from the Ss' replies to questions about weight of themselves, a feather, and a school bus was the gradual increase across the four age groups in the use of the adverb as a modifier. Two Ss in each of the six- and seven-year-old groups used the adverbs "very," "real," or "quite" tp modify the adjectives "light" and "heavy." However, five eleven-year-old Ss used the five adverbs "real," "quite," "really," "awful," or "quite" to modify "light" and "heavy."

Summary

The following findings should be interpreted with consideration for the limitations given at the beginning

of Part IV.

1. There seemed to be a trend toward a refinement of labels for criterial properties observed and labelled across the age levels whenever there was a possibility to do so.

2. The most precise labels appeared in the responses of Ss ages nine years and eleven years.

3. The trends in development of refined labels appeared to be similar for individuals and groups.

4. The observed nature of differences in the refinement of labels was as follows:

a. The use of the phrases "kind of," "real," and "sort of" at ages nine and eleven years suggested that some Ss noted the differences in the properties of a word or idea but were unable to arrive at a precise and explicit statement about it.

b. In response to some of the stimuli, inaccurate definitions of words were exemplified by the use of phrases or sentences, and defined accurately by older Ss by a single word (e.g., from "a little bit loose" to "flexible").

c. Ss also demonstrated refinement of labels by changing from the use of a single word to another, but more accurate, word (e.g., from "fly" to "soar").

d. Similes and metaphors were employed by Ss from the four age levels in tasks which suggested the use of comparison or contrast.

e. There was an increasing use of the adverb to intensify or qualify meaning ffom the younger to the older Ss.

V. REPERTOIRE OF EXPRESSIONS AVAILABLE TO EXPRESS IDEAS

Another method for determining the children's growth in word meaning was to examine the range of expressions used by the Ss to express an idea. These devices and labels constitute an individual's repertoire of expressions which could be utilized, according to his communication needs. The choices he could make would depend on the repertoire available to him. Combinations of devices and labels employed in responses to the varied stimuli in the four tasks were identified and examined for common characteristics. The limited data for this strategy in shaping meaning seemed to indicate eight different devices which the Ss used. These devices have been stated here as continua in expression of ideas.

1. Demonstration→linguistic label plus demonstration

The youngest Ss described the "sound" of "horse" as "the sound they make it is . . . " and then made the sound. However, by age nine the following responses were given:

a. by individuals.

neigh; a funny sound;
sort of (made the sound)

b. by groups.

sort of a (made the sound) . . . .
like that . . . fun laugh sort of . . .
go like neigh

Both an explicit label "neigh" and the sound were given. The child had a choice of expressions and used both of them. The eleven-year-old groups included "whinny" and "neigh" in their repertoire in addition to making the sound of a horse.

This finding was supported in the responses for the stimuli from Task 4 when the Ss told about the sounds of chickens and cars. The Ss were asked to reply to the following commands:

a. Tell me about the sounds of chickens.

b. Tell me about the sounds of cars when they are first started.

In reply, four of the eight six-year-old Ss gave the sounds of chickens and cars. The remaining four replied with "a loud noise" or "I don't know." The seven-year-old Ss followed the same pattern of response with four Ss giving the sounds of chickens and cars and four giving vague answers (e.g., "they, uh, gobble"; "make a loud noise").

The two older groups, in general, answered with linguistic labels rather than with sounds. Only one subject in each group gave the sounds of chickens and cars. For example, the following linguistic labels for the sounds of chickens were given:

a. by nine-year-old Ss.

loud; quite . . . uh . . . noisy; sort of scream their head off; funny sound; screech; screech a lot

b. by eleven-year-old Ss.

> like cluck; like they're screaming at each other; roosters crow . . . chickens cluck . . . chickens peep; loud and noisy; they make a racket

2. Label → combination of label and qualifiers.

The Ss' connotations of "pollution" up to age nine were that it was "bad." For example, the six-year-old Ss stated:

> Pollution is very bad; . . . and pollution's very, very bad for people . . .

Seven-year-old Ss continued with "It's not good for you" and "It's bad." Nine-year-old Ss added, "Sometimes pollution cannot be very good for you." However, the eleven-year-old Ss employed the same modifiers as did the younger Ss, added other modifiers and introduced a degree of tentativeness. They stated:

a. Pollution is a bad thing (retention of label "bad")

b. Pollution's a nasty word . . . Pollution is terrible (addition of other modifiers)

c. Sometimes pollution is very bad and sometimes it's just fair (introduction of tentativeness).

A similar development was noted in the Ss' statements about the smell of pollution. Ss, ages seven years and nine years, stated " . . . it also stinks . . . " and " . . . stinks up an area." The eleven-year-old Ss exercised a greater choice of modifiers embedded in a greater quantity of language:

> . . . it smells real awful; it is very dirty smelling; even the water smells horrid; you can smell it sometimes; if you're in the city you can smell it and it's not a very nice smell . . . .

3. Modifier→combination of modifier, synonyms of the modifier, and generalizations

In speaking about the "size" of "horses," the Ss maintained the labels "big" and "small" throughout the four age levels. The synonymous modifiers "short . . . tall . . . medium-sized . . . very tall" were included in the responses of both the nine-year-old and eleven-year-old Ss. The generalizations "different sizes" and "very odd sizes" were added to the repertoire of expressions for the oldest Ss, the eleven-year-olds.

4. Use of qualifying fragments

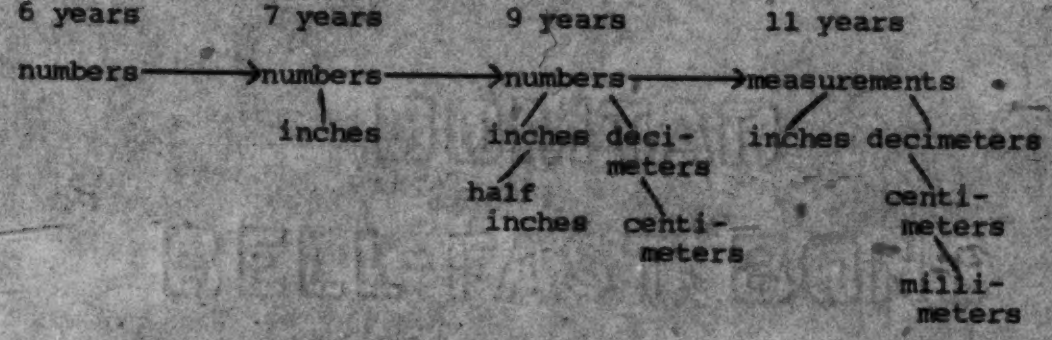
The Ss' connotations of "nervousness," part of Task 2, provided a medium for examining the use of fragments such as "sort of" and "kind of" in an intermediate stage of expressing meaning. The qualifying statements were most prevalent in responses of nine-year old Ss:

6 years	7 years	9 years	11 years
. . . you do something bad	. . . when I get scared; you're kinda scared . . .	. . . sort of afraid; feel sort of scared; kind of like shaking; kind of scared; scary; scared; you're shy . . . think you're gonna get a whopping	. . . like stage fright; sort of like being scared . . . being frightened; scary; scared; over-frightened; plain scared . . .

5. Label→class name and supporting criterial properties

Growth of word meaning can be observed also when a S moves up the levels of abstraction suggested by

Hayakawa (1962) and moves down for details and subclasses whenever it is necessary (Moffet, 1968, p. 29). The Ss' responses to "ruler" from Task 2 suggested a development from "numbers" at age six to the generalization "measurements," supported by the provision of criterial properties (e.g., "inches"; "decimeters") at age eleven.



6. Comparison→generalized statement

Reference to "horse," Task 1, and "seagull," Task 3, indicated the use of comparison at ages six, seven, and nine years to express ideas, with a change to generalized statements and precise statements at age eleven. For example, some Ss said a horse is "bigger than us" and "bigger than a pony" at ages six and seven. Statements of "different sizes; large; tall; big" were included in the repertoire of eleven-year-old Ss. In speaking about "seagulls," the change from comparison to generalized statement was as follows:

6 years	7 years	8 years	11 years
(no statement relative to size)	. . . they're smaller than us . . . (comparison used)	. . . it's about as big as a ruler . . . (comparison used	. . . they're different sizes . . . (no use of comparison)

7. Adverb⟶ increasing use of adverbs

The increasing use of adverbs from one age level to another was reported earlier in this chapter. In response to a question about "weight" (Task 4), adverbs were used by one-quarter of the Ss at ages six and seven (e.g., "very heavy"; "quite heavy"). However, over half of the eleven-year-old Ss included the adverb a total of fifteen times in their repertoire of expressions (e.g., "very heavy"; "really heavy"; "awful heavy").

8. Similes and metaphors⟶ continuing use of similes and metaphors

Responses to telling the shape of a pear-shaped cutout revealed the Ss' facility with two figures of speech, simile and metaphor. The limited data given (Table 4.26) suggested that the Ss at each of the four age levels possessed the ability to use similes and metaphors in shaping their meaning for the cutout.

Summary

The findings were as follows:

1. There was some evidence that older Ss had a greater repertoire of expressions to convey an idea. Explicit responses were added to the earlier more implicit responses of the younger children.

2. Similes and metaphors appeared at all age levels and in response to only one stimulus.

3. Age nine tended to be a "sorting-out" for the Ss in their expression of ideas. In some instances, they replied in terms characteristic of the eleven-year-old

Ss in this study. In other instances, they responded in terms characteristic of the seven-year-olds.

VI. REFINEMENT OF CRITICAL ATTRIBUTES THAT DEFINE CLASSES

Refinement of critical attributes that define classes was another dimension devised for examining children's growth in word meaning. As the Ss responded orally to a stimulus, they expanded the meaning of the term through the range of the criterial attributes they could use for it (horizontal organization). This meaning was then subsumed under a generalized term which bore a hierarchical relationship to the referent (hierarchical organization). All of the Ss' responses were examined. Any attributes which helped to define the class name for the stimulus were selected.

This development is examined relative to the first three tasks, the age of the Ss, and a comparison of the responses of pooled groups and pooled individuals. The findings are supplemented with responses to the fourth task, questions designed to elicit controlled responses.

Responses to Verbal Stimuli

Table 4.27 provides illustrations of attributes and class names employed by groups and individuals as they defined the classes for "horse" and for "illness." Figure 4.4 contains the information about "horse" from Table 4.27 in a diagrammatic illustration of how Ss in the pooled groups at four age levels refined critical attributes eventually leading to "mammal," the class name for "horse."

TABLE 4.27

ILLUSTRATIONS OF REFINEMENT OF THE ATTRIBUTES THAT DEFINE CLASSES--VERBAL STIMULI

Subjects	Stimulus	Chronological Age in Years 6	7	9	11
Pooled groups	horse	can die; fur; eat hay; drink water; have babies	they die; furry mane; hair; hooves; eat hay; colt; animals	eat hay; oats; carrots; apples; run; fur; hooves; wild or tame; colts; animals	they're born; eat hay; grass, straw; drink water; hooves; fur; can be wild; colts; horse family; mammals
Pooled individuals	horse	eat oats and hay; run; furry manes; some kind of hairs on their heads; get babies; wild horses	run; eat hay; furry; furrier than us; they're real; hooves	run; eat grain, grass, apples, hay, carrots; fur; hooves; colts; animals; mammal	run; eat oats, carrots, grass, hay; drink water; furry; fur; hooves; colt; animal; mammal
Pooled groups	illness	you ache; throw up; sometimes you die; (a few names--related to personal experience)	headache; sore throat; bad cough; pain; get dizzy; vomit; sneeze; people die; germs come in your throat (many named--personal & others); diseases	hoarse voice; don't feel good; breathing germs; dirt; people die; other kinds of illnesses (increasing number named--personal & others)	can kill you; some . . . real painful; can be cured; germs; it's what you eat; different kinds (personal & others); diseases

TABLE 4.27 (continued)

Subjects	Stimulus	Chronological Age in Years 6	7	9	11
Pooled individuals	illness	fever; (a few named--related to personal experience)	something's wrong with you; can die (a few named--related to personal experience)	can kill you; some . . . contagious; bad headaches; stomach aches; caused by germs; bacteria; different kinds (many named--personal & others); diseases	some can kill you; some . . . can be cured; fever; sore throat; all different kinds (many named--personal & others); diseases

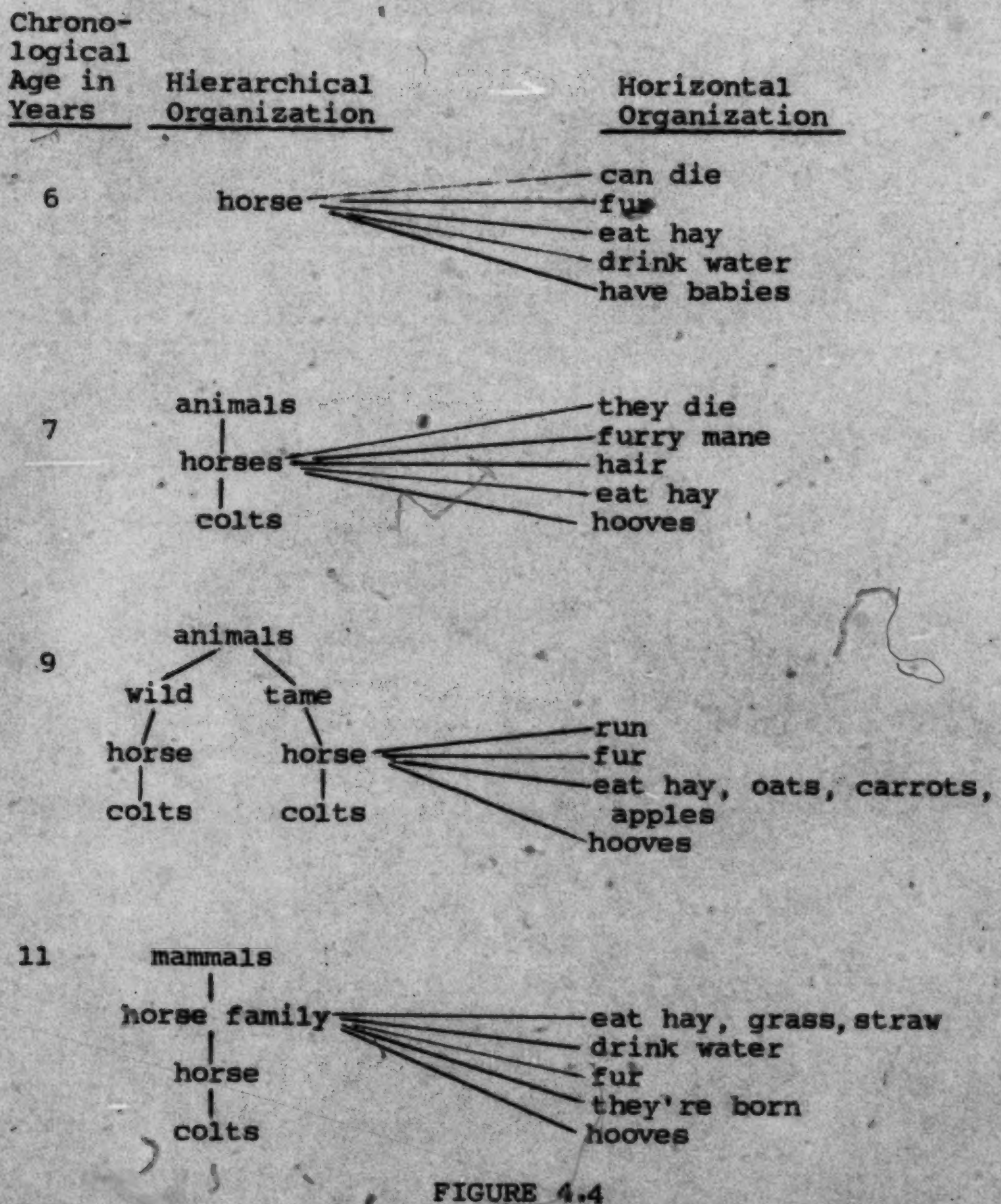


FIGURE 4.4

ORGANIZATION OF CRITICAL ATTRIBUTES BY Ss
AT FOUR AGE LEVELS IN THE DEFINITION
OF THE CLASS NAME "MAMMAL"

The Ss' responses suggested they organized their information horizontally through the provision of criterial attributes for "horse." The horizontal organization was retained at age seven in conjunction with the addition of "animals," a word bearing a hierarchical relationship to "horse." The same organization continued at age nine with the addition of two attributes, "wild" and "tame." It was not until age eleven years that the Ss included the class name "mammal" in their hierarchy and the explicit statement that a horse is part of the horse family. The most outstanding development occurred in the hierarchical, rather than horizontal, organization of attributes. The data from pooled individuals (Table 4.27) suggested a similar growth of meaning except that the class name "mammal" was used in conjunction with "animals" at nine years and was retained at eleven years of age.

In telling all they could about "illness," Ss from both sources, individuals and groups, produced responses mainly on a horizontal organization (e.g., names of diseases and symptoms of illnesses). At the seven-year-old age level, they added "causes" and "parts" of "illnesses." For the nine- and eleven-year-olds, some evidence of a hierarchical development was suggested in the following statements:

> . . . some . . . contagious; . . . can kill you; some. . . can be cured.

It is possible that the abstract nature of the stimulus

prevented Ss of this age and ability from moving higher in the levels of abstraction. Neither group nor individual contexts resulted in an earlier hierarchical organization of critical attributes that define classes.

Responses to Real and/or Vicarious Experiences

When either real or vicarious experience was provided for each task (Table 4.28), Ss' responses suggested a trend toward the refinement of definition in four out of six cases (viz., "orange," "ruler," "nervousness," and "happiness"). The degree of difficulty of classification may have prevented clear evidence being given for "song" and "game."

The hierarchical and horizontal organizations were similar for the two younger age groups. As illustrated in Figure 4.5, an orange as "fruit" and "like a grapefruit" or "like an apple" appeared at ages six and seven years. In each age group, common criterial attributes for "orange" and "grapefruit," and "orange" and "apple" were elicited. The additional attributes for "orange" were not given in conjunction with the other fruits and, therefore, are listed separately. "Fruit" was confined to "citrus fruit" at age nine years. Although the label "citrus fruit" was not expressed verbally at age eleven years, the Ss did suggest there was a similarity between a grapefruit and an orange. Later in this section under "Controlled Responses," the Ss' responses suggested that

TABLE 4.28

ILLUSTRATIONS OF REFINEMENT OF THE ATTRIBUTES THAT DEFINE CLASSES--REAL AND/OR VICARIOUS EXPERIENCES

Stimulus	Chronological Age in Years			
	6	7	9	11
Orange	Like grapefruit cause it's a fruit that you eat; juicy; peels on it	like an apple . . . cause it's round and it has peelings and an orange has peelings; eat; juice; on trees a fruit	juicy; peel them eat them; grow on tree; fruit; citrus fruit	peel them; eat it; grows on a tree; fruit; something like a grapefruit
Nervousness	angry; get mad	feel strange; kinda scared; very, very shy; you're mad	a feeling; funny feelings; kind of scared; sort of afraid	kind of a scary feeling; being frightened; plain scared
Ruler	measure; make a straight line	measure; make a straight line; different kinds; yardsticks	measure; make a straight line; tapes; yardsticks; foot ruler	measure; make a straight line; yardstick; tape measure; protractor; different kinds of rulers
Happiness	means you're smiling; you're happy about something	people are happy; is fun; it's nice; you're glad; you're laughing and gay	happy; real glad . . . not crabby; it's feeling really gay; joyful	a great feeling; excited; really happy; glad

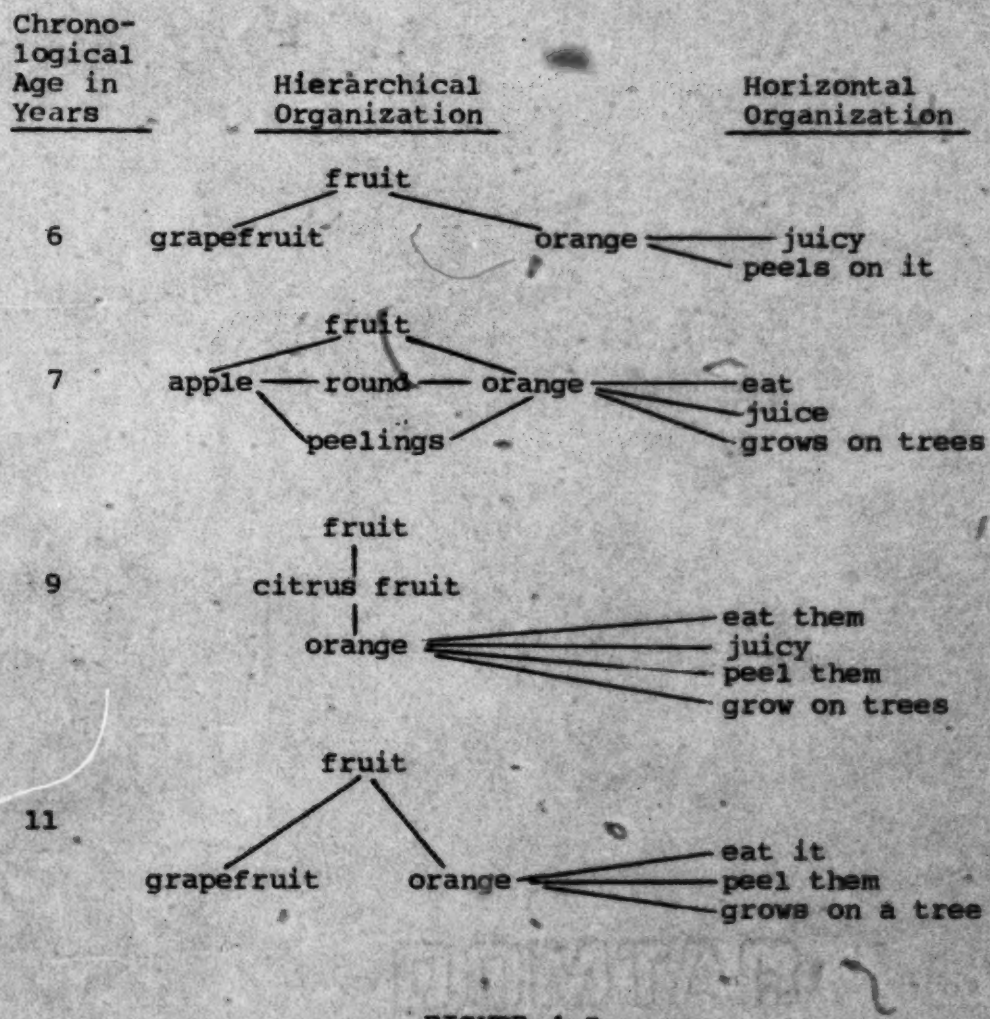


FIGURE 4.5

ORGANIZATION OF CRITICAL ATTRIBUTES BY Ss
AT FOUR AGE LEVELS IN THE DEFINITION
OF THE CLASS NAME "CITRUS FRUIT"

the term "citrus fruit" was not firmly established with the Ss used in this study.

For both "nervousness" and "happiness," the Ss at age six years and seven years produced criterial attributes for these stimuli (Table 4.28). However, a hierarchical organization appeared at age nine when the superordinate "feeling" for "nervousness" was introduced. At age eleven years, "feeling" became a superordinate for the two stimuli, each with its own critical attributes.

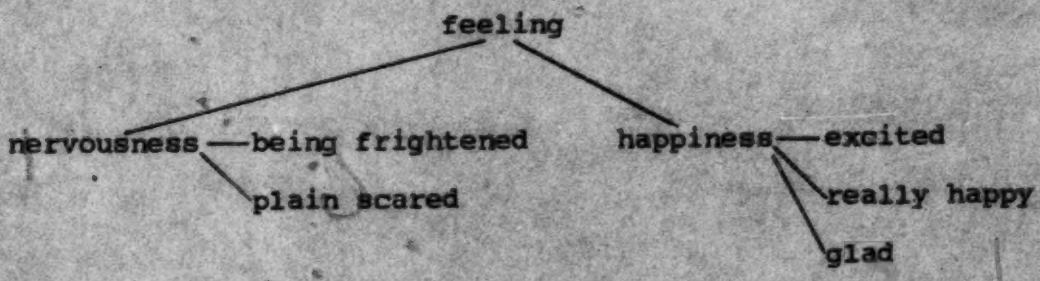


FIGURE 4.6

ILLUSTRATION OF THE CRITICAL ATTRIBUTES THAT DEFINE THE CLASS NAME "FEELING"

For "ruler" (Table 4.28), the six-year-old Ss began with "use" or "function" (e.g., "measure") and retained this category at the subsequent age levels while adding different kinds of measuring instruments (e.g., "yardstick"; "foot ruler"). At age eleven years, they had not grouped the instruments under one heading such as "measuring things." A superordinate of "ruler" did not appear in the Ss' responses.

When a comparison of the responses from Tasks 1 and

2 was made, it appeared that real and/or vicarious experiences assisted the Ss in the organization of critical attributes that define classes. However, the nature of the stimuli may have been the major factor in the organization. For a stimulus such as "ruler," the class name would not likely be part of the Ss' daily experience. Thus, the label would be unlikely to appear in an open-ended response. In the comparison between responses to stimuli in the second task, the Ss appeared to organize equally well with the concrete stimulus "ruler" and the abstract stimuli "nervousness" and "happiness."

Responses to Visual Representations

Table 4.29 provides illustrations of attributes that were used to define classes when the Ss were supplied with visual representations of the referents. The Ss' responses to "seagull" suggested the horizontal and hierarchical organizations that appear at four different age levels (Figure 4.7).

The Ss' responses to "seagull" suggested that ages six and seven were periods of uncertainty in classification of a referent (e.g., from "look sort of like birds" at age six to "they're animals" at age seven to "they're birds" at ages nine and eleven). At ages six and seven, they appeared to be aware of the existence of "class name" for "seagull" but were unable to apply an accurate label. In contrast to the concrete referents of "seagull"

TABLE 4.29

ILLUSTRATIONS OF REFINEMENT OF THE ATTRIBUTES THAT DEFINE CLASSES--VISUAL REPRESENTATIONS

Stimulus	Chronological Age in Years			
	6	7	9	11
Seagull	wings; feathers; fly; look sort of like birds	wings; feathers; they nest; fly; swim; they're animals	wings; feathers; fly; swim; lays eggs; hatch out of eggs; babies; all kinds of birds (several named); they're <u>birds</u>	wings; feathers; fly; swim; lays eggs; (one other bird named); it's a <u>bird</u>
Dog	fur; like dog food; pets; bull dog; police dog	coat of fur; pups; eat meat; pet; member of the wolf family; animal; <u>mammal</u>	fur; pups; eat meat; carnivore; babies are born; pets; certain breeds (several named); animals; <u>mammals</u>	fur; pups; eats dog food; for pets; wolf; coyote; different kinds (several named); animals
Job	all kinds of job (named his own job)	different kinds of jobs (a few within his own personal experience named--his & those of his immediate family)	it's your responsibility to do it; make money; different kinds (several named)	what people are responsible for; give you money; different types of jobs (several named)
Poverty	there's people; half dressed; dead people; ripped up clothes	get hungry; sometimes you die; poor; little food; being sick; ripped up clothes	can die; really poor; hungry; starvation	starve; can die; no right foods; poor; sick; disease; in slums

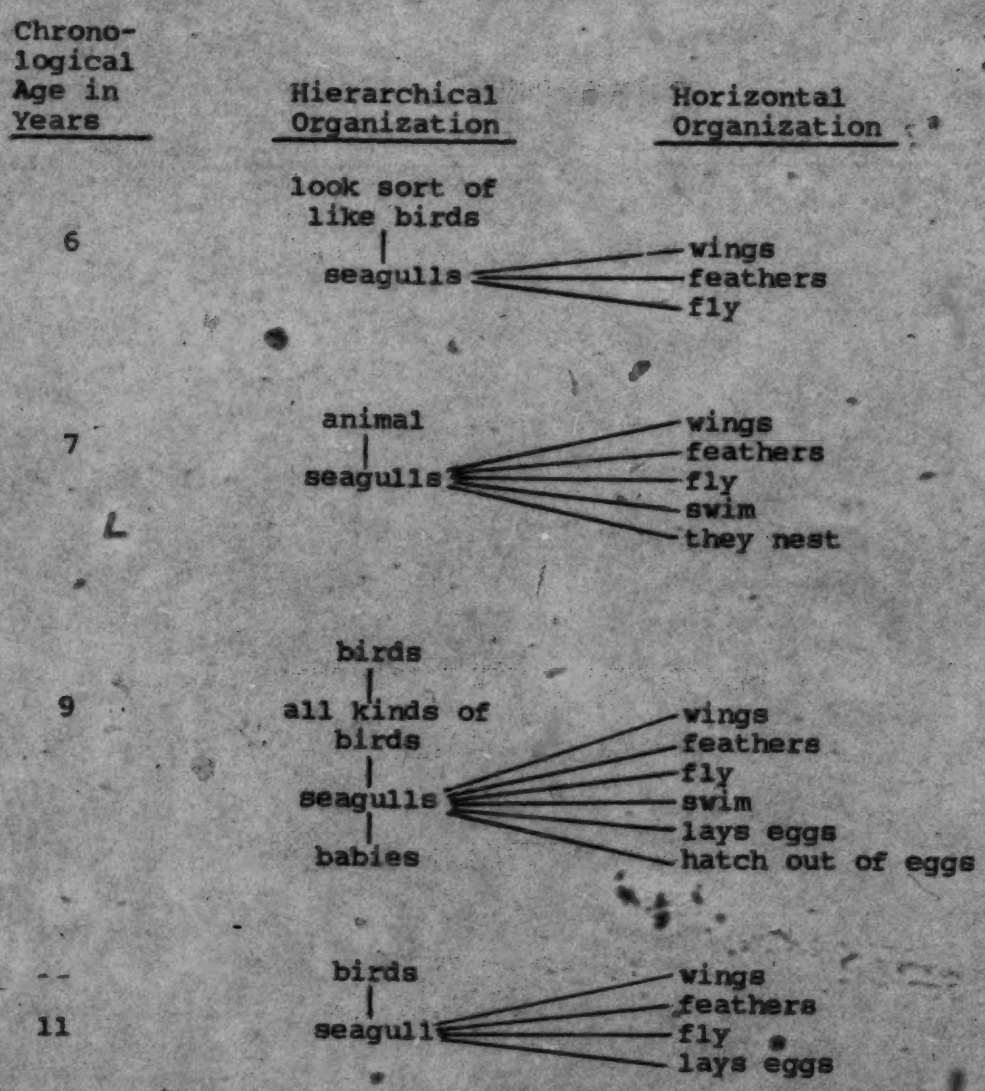


FIGURE 4.7

ORGANIZATION OF CRITICAL ATTRIBUTES BY Ss
AT FOUR AGE LEVELS IN THE DEFINITION
OF THE CLASS NAME "BIRDS"

and "dogs," the more abstract referents of "job" and "poverty" did not generate class names. Responses seemed to indicate a horizontal production of attributes for "poverty" without arriving at "class name" in the hierarchical structure. However, the responses to "job" suggested a hierarchical organization which began at age six and continued without further development (Figure 4.8). It appeared that the Ss were acquiring an increasing understanding of "poverty" and "job," but were not able to generalize about them as "classes."

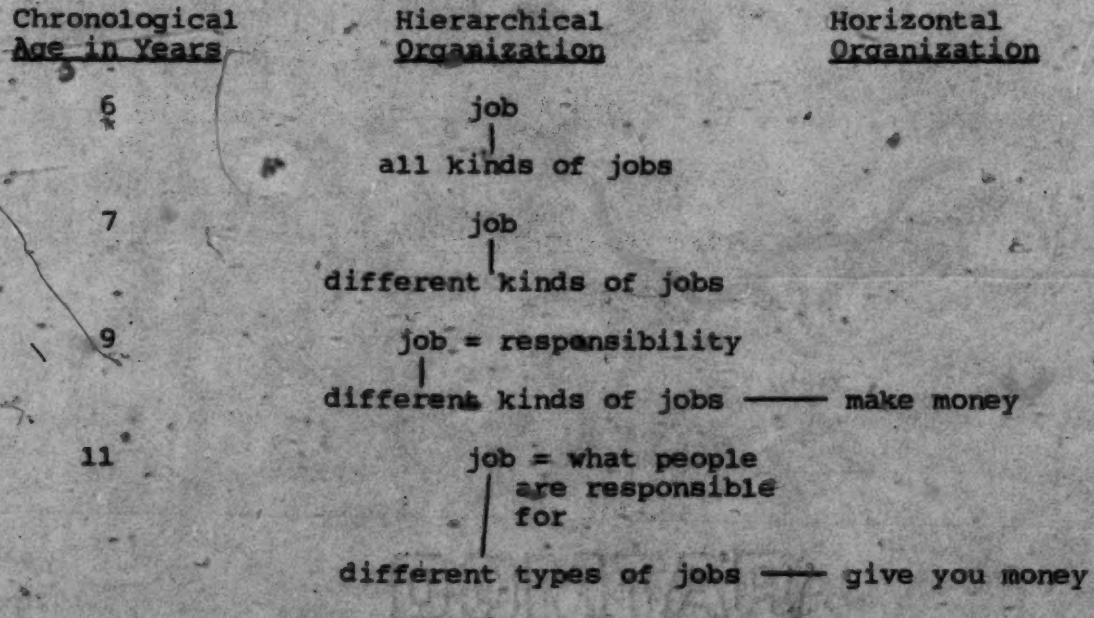


FIGURE 4.8

ORGANIZATION OF CRITICAL ATTRIBUTES BY Ss AT FOUR AGE LEVELS IN SPEAKING ABOUT "JOBS"

In responding to two pictures of dogs, the six-year-olds referred only to critical attributes in horizontal organization (Table 4.29). However, the seven-year-olds

not only referred to the attributes for horizontal organization, but their responses showed a hierarchical arrangement which included the following: "animal"; and "pups." In general, both the hierarchical and horizontal organizations in response to this stimulus were continued by the Ss, ages nine and eleven.

The responses to the six visual representations suggested that the Ss were more advanced in organization of critical attributes that define classes of concrete referents than concrete-abstract or abstract referents. Although there was a beginning in hierarchical development in "job" (concrete-abstract level), the responses to "poverty" (abstract level) suggested that the Ss could produce only specifics and could not generalize in response to this particular stimulus.

Controlled Responses

The following instructions were given to eight Ss at each age level:

> Tell me some ways in which oranges, grapefruit, and lemons are all alike.
>
> Tell me some ways in which dogs, horses, and cows are all alike.

(All responses for the eight Ss are located in Appendix D.)

The six-year-old Ss referred to the categories of "taste," "shape," "color," and "action upon" in reply to the first instruction but did not mention "class name." In reply to the second instruction (Table D.2) they identified the categories of "weight," "action of," "parts

of," and "sound." Responses of seven-year-olds included class name: "vegetable" once; "fruit" twice; and "animal" four times. However, when class names were given, no further attributes were added as if no more were needed.

Nine-year-old Ss, in general, began by giving criterial attributes and led up to the identification of class name. For example:

> They're skin and meat, and you can . . . and they're all animals.

Class names given in response to the first instruction were "fruit" (twice) and "citrus fruit" (once). For the second instruction, responses of "animal" and "mammal" were given twice each.

The oldest group succinctly stated "fruit" three times, "citrus fruit" once, and "animals" four times in reply to the instructions. Ss who gave class names did not give criterial attributes. Conversely, Ss who gave criterial attributes did not give class names.

The findings from the controlled responses supported the previous findings relative to horizontal and hierarchical organization leading up to class name. The six-year-old Ss produced specifics in a horizontal arrangement. The seven-year-old Ss, however, made a beginning in hierarchical organization which continued until age nine or eleven.

Summary

The findings relative to organization of critical

attributes that define classes are summarized as follows:

1. In each of the first three tasks, there appeared to be evidence of increasing organization of the critical attributes that define classes from age six years to age eleven years.

2. The Ss, generally, were more able to attach class names to stimuli which were representative of concrete rather than concrete-abstract and abstract things.

3. In response to verbal stimuli with concrete referents, both groups and individuals at six years of age organized specifics along a horizontal plane. At age seven, the horizontal organization was continued with the addition of hierarchical structure which led into "class name." Both the horizontal and hierarchical organization continued at ages nine and eleven. For stimuli with abstract referents, the same trend was observed except that the Ss, generally, tended not to be able to provide class names by age eleven.

4. Real and/or vicarious experiences and visual representations as compared with verbal stimuli appeared to provide more assistance to the Ss in identifying the specifics leading up to class name.

5. Findings suggested that age nine years was a significant year in the precise definition of class name for the tasks given.

VII. APPLICATION OF WORD TO MORE OBJECTS, IN MORE CONTEXTS, IN MORE TIMES, FROM MORE POINTS OF VIEW

McFetridge (1973) hypothesized that growth in word meaning may be identified partly as the child's increasing application of the word to more objects, in more contexts, in more times, from more points of view as each word becomes more generalized. The Ss' open-ended responses to each stimulus in Tasks 1, 2, and 3 were examined, within and between categories of meaning, to determine whether there was evidence to support the hypothesis. Developmental trends across the age levels were noted. Since the Task 4 questions encouraged convergent responses, the data from this task did not apply to this hypothesis.

Response to Verbal Stimuli

An examination of the responses to four verbal stimuli (Table 4.30) suggested that groups and individuals showed greater differentiation at each succeeding age level in the way they applied the words "horse" and "holiday." Greater differentiation was shown by groups as they applied the word "table"; greater differentiation was shown by individuals in the word "pollution." Thus, Ss showed a broad application for some stimuli which represented concrete, concrete-abstract, and abstract referents.

The Ss were limited in their application of two additional stimuli, "illness" and "anniversary," to

TABLE 4.30

ILLUSTRATIONS OF APPLICATION OF WORD TO MORE OBJECTS, IN MORE CONTEXTS, IN MORE TIMES FROM MORE POINTS OF VIEW IN RESPONSE TO ORAL VERBAL STIMULI

Subjects	Stimulus	Chronological Age in Years 6	7	9	11
Pooled groups	table	(the table in a house)	my grandma's (fold-up table); tables in a school; tables in a restaurant	(the table at home)	at home; in school; in libraries; in the Pilgrim Days; in the Middle Ages; originated in the cave man days
Pooled individuals	pollution	(in the community); gas pollution; paper; smoke; bottles . . .	(community and factories); garbage; smog; paper; junk	(community, factories, and slums); garbage; smoke; smog . . . ; in England; when trains and railroads came out . . .; in a few thousand years	(community and factories); garbage; fumes; smoke . . . ; Edmonton, New York; some parts of the world; in Venice; in Europe . . . the Rhine; in Japan; in United States; in Canada
Pooled groups	horse	farmers have horses; at my Grandma's; toy horse	Grandad's farm; at the zoo; at the circus; rodeo horse; sea horse; toy horse	in horse shows; my uncle . . . ; in circuses; R.C.M.P. musical rides; cowboys used them; Indians used them long ago; toy horse; sawhorse	in horse shows; my uncle . . . ; in movies; on the farm; at the circus; back into 1817; a few hundred million years ago; seahorse

TABLE 4.30 (continued)

Subjects	Stimulus	Chronological Age in Years 6	7	9	11
Pooled individuals	horse	in rodeos; used by the police	at the farm; in a zoo; in a race; toy horse	at my grandma's farm; my uncle's horses; on the plain; in the olden days	in western shows; in R.C.M.P.; at the farm; cowboy's horse; army; Spaniards and Aztecs; Indians used them
Pooled groups	holiday	(personal experiences with holidays)	(personal experiences); a day off; Jasper; Holiday Inn	(personal holiday); Mom and Dad's holiday; summer, winter; spring holidays; Europe; all different countries; Holiday Inn; holiday trailer	(personal holiday); with other people; day off; different ways of holidays; special day in England; in different lands; actually anywhere; Holiday Inn; holiday trip; holiday pack; holy day (origin in Greece)
Pooled individuals	holiday	(personal experiences with the family); all around the world	(with family, relatives and friends); a day off; summer holiday; winter holiday	(with family and friends); summer and spring holidays; all over; holiday trailer	(with family and friends); day off; special days; fun time; very, very sad (funerals); around the world; in Ancient Greece; holiday pay; Holiday Inn; Roman holiday (jewellery)

familiar contexts. For example, no reference was made to "more objects" or "from more points of view" in regard to "illness," or to "more times" in regard to "anniversary."

Responses to Real and/or Vicarious Experiences and Visual Representations

In response to real and/or vicarious experiences and visual representations, broader application of words was identified in two instances, "song" and "seagull" (Table 4.31). In response to "song," the six-year-old Ss spoke of the song they sing, but in a number of contexts involving them personally (e.g., "to your teacher; with your class; to yourself; at the festival"). They had one point of view about songs--"happy."

The seven-year-olds spoke mostly in the personal context of "school; concerts; at home," but also included "others at a dance" and "with other people." Both "happy" songs and "sad" songs were included in their point of view.

At age nine there was a broader application of the word "song." In addition to the personal experience of songs "in musical classes," "at song festivals," "at parties," and "while travelling," they also referred to "radio," "records," "singers . . . Sonny and Cher" and "German singers." "Other times" were included--"in the olden days cowboys . . . ." Songs were not only "happy" or "sad," but also "angry, complicated, or easy."

The meaning for "song" became even more generalized

TABLE 4.31

DEGREE OF GENERALIZATION OF WORD MEANING IN Ss' RESPONSES TO "SONG" AND "SEAGULL"

Stimulus	Application	Chronological Age in Years 6	7	9	11
song	to more objects				songs for parents; songs for kids; birdsongs
	in more contexts	to your teacher; with your class; to yourself; at the festival	school; concerts; at home; others at a dance	in musical classes; at song festivals; at parties; while travelling; radio; records; Sonny and Cher; German singers;	radio; television; different seasons
	in more times	(the present)	(the present)	in the olden days, cowboys . . . (the present)	(the present)
	from more points of view	happy	happy; sad	happy; sad; angry; complicated; easy	sad; really happy; really nice; some bad; one person one feeling and the other person a different feeling

TABLE 4.31 (continued)

Stimulus	Application	Chronological Age in Years 6	7	9	11
seagull	to more objects			birds; name of a lake	bird
	in more contexts	in the water	on the land; in a flock	in a little group; near the water; near the land; on dumps	near the sea; on land; most parts of Canada; in a flock
	in more times	(the present)	(the present)	a long time ago (and the present)	(the present)
	from more points of view			. . . fishermen . . . bad luck to have a seagull follow you	

for the eleven-year-old Ss as they referred to "songs for parents," "songs for kids," plus "birdsongs." The contexts varied from "radio" and "television" to the "different seasons." Various points of view were expressed ("sad; really happy; really nice; some bad"). One child generalized his meaning for "song" when he stated, "One person one feeling and the other person a different feeling."

The Ss examined two slides of seagulls: one slide showing seagulls in flight off the coast of Vancouver Island; the other slide showing a seagull hitching a ride on a ferry boat (Appendix A). The youngest Ss referred to one context and one point of view--"in the water." The seven-year-olds added two contexts--"on land" and "in a flock." The trend toward increased generalization was revealed in the statements of the nine-year-old Ss as they spoke about the objects, not only as "birds," but also as the "name of a lake." They placed the seagulls in the contexts of "little groups," "the water," "the land," and "dumps." In addition, they considered the point of view of fishermen in another time--"a long time ago . . . fishermen . . . bad luck to have a seagull follow you." The oldest Ss reverted to one object--"bird," one time--the present, one point of view--their own, but maintained a variety of contexts--"near the sea," "on land," "most parts of Canada," and "in a flock."

For three of the stimuli ("orange," "ruler," and "dog"), the responses did not reveal broad application

TABLE 4.32

DEGREE OF GENERALIZATION OF WORD MEANING IN Ss' RESPONSES TO "ORANGE," "RULER," AND "DOG"

Stimulus	Application	Chronological Age in Years 6	7	9	11
orange	to more objects	orange (fruit)	orange (fruit) orange (color)	orange (fruit) orange (color) orange (adjective) orange (last name)	orange (fruit) orange (color) orange (adjective)
	in more contexts	oranges--Japanese, Sherwood Park, Edmonton	on trees; buy them in stores	off trees; in the store	trees; supermarkets; different parts of the world; in warm climates
	in more times	(the present)	(the present)	(the present)	(the present)
	from more points of view	good; I like them; good to eat	good	(no point of view expressed)	good; very good; delightful; don't really like them
ruler	to more objects	(instrument for measuring)	(instrument for measuring) ruler of kings; ruler of the land	(instrument for measuring); kings; emperor penguins; queen; group of ministers	(instrument for measuring) ruler of a country; king; emperor
	in more contexts	at my house	rulers at school	in schools; carpenters	in school

TABLE 4.32 (continued)

Stimulus	Application	Chronological Age in Years 6	7	9	11
ruler (continued)	in more times	(the present)	(the present)	(the present)	(the present)
	from more points of view	(their own)	(their own)	(their own)	(their own)
dog	to more objects	(animal) dog paddle (adjective)	(animal) dog paddle (adjective) dog pound (adjective) you dog (expression	(animal) you're a dog (expression) dog trainer; hot dogs; doggie bag; doggone it	(animal) hot dog; you dog, go to the dogs, doggone (expressions) dog catcher
	in more contexts	in stores; SPCA; police dogs (their own)	police dog; television program; (their own)	my dog in shows; farm; city; special schools; different countries	my dog in a book; in some shows; at the SPCA; in the city; dog pound
	in more times	(the present)	(the present)	(the present)	(the present)
	from more points of view	(their own); you get scared	(their own) very nice; cuddly; cute	(their own) cute; can be fun; can be pretty ugly. doesn't like men; like children	(their own) very good things; cute; beautiful. man's best friend

of the word. The limitations of the hypothesis are described as follows (Table 4.32):

1. For "orange," no S in any age group made reference to "more times."

2. The stimulus "ruler" was not applied broadly to "more contexts," "more times," or "more points of view."

3. No S made any reference to "more times" for "dog." Otherwise, there was a greater differentiation in the word from the younger to the older age levels.

The Ss' responses to the remaining seven stimuli did not indicate a trend toward broader application of the words. It is possible that the experiences and visual representations may have restricted the Ss' application of the word to the context before them and did not allow for the freedom to diverge as with the verbal stimuli.

Summary

The following trends appeared as the Ss' meaning for words became more generalized:

1. There was some evidence of application of words to more objects, in more contexts, in more times, from more points of view by groups and individuals from one age level to another for Task 1 (four verbal stimuli out of six).

2. The Ss' responses for Tasks 2 and 3 suggested trends of greater differentiation for words in two

instances out of twelve. Other responses tended to be tied to the specific stimulus as presented.

VIII. REVIEW STATEMENT

In this chapter, the findings relative to the characteristics of word meaning of Ss ages six, seven, nine, and eleven years were reported. Four tasks, each containing several stimuli, were designed to elicit oral responses from individuals. Groups of Ss responded to the stimuli for the first task only. The responses were examined to determine frequency and quality of expression of word meanings: (1) frequency of criterial properties and categories of meaning, (2) refinement of labels and development of a repertoire of expressions, and (3) nature of organization and application of meaning. A summary of the findings is given in Chapter V.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

The focus of studies in word meaning has moved from quantitative indexing of vocabulary to an examination of meaning combining both quantity and quality. In recent years, language researchers at the University of Alberta have focussed on word meaning: development of instruments to measure quality; interrelationship with other areas of learning; means of acquisition; and application to instruction. One area which seemed to require extension was the nature of differences in the word meaning of children at different age levels. The purpose of this study, therefore, was to explore the nature of word meaning expressed in the oral responses of Ss (subjects) ranging in chronological age from six years to eleven years.

This chapter begins with a summary of the design, procedures, and findings of the study, followed by a statement of the conclusions. Implications for education and suggestions for further research conclude the chapter.

I. SUMMARY OF THE STUDY

The summary is divided into two major parts: (1) a brief report of the design and procedures; and (2) a summary of the findings reported in Chapter IV.

Summary of the Design and Procedures

To explore the nature of children's word meaning, Ss ages six to eleven were asked to respond to (tell all they could about) several different stimuli. Eighteen stimuli were distributed equally over three tasks: verbal (Task 1); real and/or vicarious experiences (Task 2); and visual representations (Task 3). Within the three tasks, the stimuli were considered representative of concrete, concrete-abstract, and abstract points on a concrete to abstract continuum. Task 4, a series of direct questions and commands related to specific categories of meaning, was designed to fill in "gaps" of meaning not revealed in the first three tasks. The tasks were presented in two settings: (1) adult-individual for Tasks 1, 2, 3, and 4 and (2) adult-group for Task 1, verbal stimuli. The responses were taperecorded and later transcribed to written protocols.

Sixty-four Ss, with equal numbers of boys and girls from years (Grades) 1, 2, 4, and 6 in three elementary schools, made up the sample for the study. All Ss were residents of a suburban community adjacent to Edmonton, Alberta, and rated between 100-115 on an

intelligence test administered by the investigator. One-half of the Ss responded individually; one-half responded in groups of four.

The study focussed on the following questions:

1. What are the common characteristics of the categories of word meaning and the means of expressing these categories as revealed in the oral language of elementary school children at each of four age levels?

2. What differences in the characteristics of the categories of word meaning and the means of expressing these categories occur across the four age levels?

3. What changes in categories of meaning emerge in response to:

   a. verbal stimuli?

   b. real and/or vicarious experiences?

   c. visual representations?

4. How are the changes in categories of meaning, arising from responses to varied and selected stimuli, revealed in children's oral language?

5. What effect does the adult-child setting have upon the child's oral expression of word meaning as compared with the adult-group setting?

The questions were analyzed on the basis of five hypotheses (McFetridge, 1973). It was hypothesized that children's word meaning would show: (1) increasing number of criterial properties observed and labelled; (2) increasing refinement of labels for any criterial

property; (3) increasing repertoire of expressions available to express ideas; (4) increasing refinement of the critical attributes that define classes; and (5) increasing application of a word to more objects, in more contexts, in more times, from more points of view. To test the hypotheses, the written protocols were analyzed according to criterial properties and categories of meaning given and according to the manner in which they were expressed. The categories were established originally from the research literature and the pilot study, validated by three judges, and applied to the Ss' responses. The reliability of the analysis was established by another two judges.

Summary of the Findings

The findings suggested several characterisitcs of the commonality and variability of word meaning for Ss ages six, seven, nine, and eleven years. First, the findings are organized according to the analysis of the Ss' responses and non-responses, then according to the five research hvpotheses.

Ss responding to the tasks. The Ss responded to slightly more stimuli in Tasks 2 and 3 than in Task 1. All Ss responded to the stimuli which represented concrete referents. Some of the Ss did not respond to stimuli at the higher levels of the concrete to abstract stimulus continuum.

Number of criterial properties. The findings indicated a general increase across the four age levels in number of criterial properties observed and labelled. In addition, differences in the patterns were observed. For example, although the largest number of criterial properties from verbal stimuli was named at age eleven, Ss age nine often produced the highest number of criterial properties when some type of experience was provided. Ss age seven occasionally gave the largest number of criterial properties. With few exceptions, the verbal stimuli generated more criterial properties than did either of the other two groups of stimuli.

Comparing pooled individuals and pooled groups, the individuals exceeded the groups (1) in the number of categories of meaning identified, and (2) in the number of criterial properties observed and labelled within these categories.

Multiple word meanings. The findings relative to multiple word meanings produced by individuals in the four age groups revealed a general increase in the number of multiple word meanings from age six years up to age nine years. No consistent pattern of number appeared after age nine.

Number of categories of meaning. The verbal stimuli generated a general increase in the number of categories of meaning from the younger to the older age

levels for five stimuli out of a possible six. For only one-third of the stimuli in Tasks 2 and 3 did the age groups show a pattern of gradual increase in categories named.

Across the first three tasks, all stimuli with concrete referents generated all expected categories of meaning in at least one of the age groups. There were several instances where categories of meaning did not appear at age six years but emerged at seven years or later (e.g., "prize"--"texture," "taste," "smell," and "sound"; "poverty"--"class name"; and "education"--"qualities").

Refinement of labels for criterial properties. The refinement of labels for criterial properties seemed to progress from the younger to the older age levels with the most precise labels generally appearing at ages nine and eleven years. The findings did not suggest that the refinement of labels was more evident in any one category of meaning than another. Furthermore, the pattern of refinement of labels was not altered by either an adult-to-child or adult-to-group context.

The Ss employed a variety of procedures in the refinement of labels for criterial properties: (1) the use of qualifying fragments such as "kind of" or a greater quantity of words in run-on sentences at an intermediate stage of preciseness; (2) a change from a single word of broad meaning (e.g., "run") at age six to

a single word of precise meaning (e.g., "canter") at ages nine or eleven; (3) the use of similes and metaphors at all four age levels; and (4) an increasing use of the adverb across the age levels.

Repertoire of expressions. There was some indication that elementary school children possess and use a repertoire of expressions to convey an idea. A broad range of expressions provides the child with the opportunity for more accurate communication in a variety of situations. Occasionally, the Ss, especially the younger children, began with making a demonstration of the referent (e.g., made the sound of a horse) and later combined demonstration with a linguistic label (e.g., addition of "neigh"). Other times, they started with the label (e.g., "big") and subsequently added qualifiers (e.g., "very big") and synonymous modifiers of the original adjective (e.g., "tall" for "big"). The older Ss, in identifying class name, moved up the ladder of abstraction and then gave supporting details to clarify meaning. All Ss used similes and metaphors, but in response to only two stimuli.

Ss age nine years appeared to employ expressions at times typical of the seven-year-olds and at other times typical of the eleven-year-olds in this study. Age nine, more than the other age levels, seemed to be a transition period wherein the S's struggles to clarify meaning were evident in his expression.

Refinement of critical attributes that define classes. It was found that the younger Ss, whether in groups or as individuals, generally produced criterial attributes (e.g., "eat grass"; "have fun") of the referent but the older Ss added a hierarchical order of classes (e.g., "mammals"; "horse family"; "horse") to the properties given. The nature of the stimuli appeared to influence the age level at which class names would appear. In response to verbal stimuli, the Ss produced criterial attributes at age six years followed by the appearance of class name at age seven. There was evidence of a continuing refinement of class name at ages nine and eleven. With the introduction of real and/or vicarious experiences and visual representations, the Ss appeared to identify class name at an earlier age. Within the tasks, Ss were able, generally, to identify class names for stimuli at the concrete end of the stimulus continuum earlier than at the concrete-abstract and abstract points on the continuum. Age nine years appeared to be a significant year in the precise definition of class names for the tasks given. The findings from the answers to the direct questions from Task 4 supported the findings from the other three tasks concerning the appearance of class names.

Overall, the responses suggested refinement of the critical attributes that define classes from the younger to the older Ss. The development began, generally, with

the labelling of criterial properties (e.g., "wings"; "feathers") and continued with labelling plus the addition of class name (e.g., "bird") at a later age. This period was followed by a continuation of labelling the criterial properties in conjunction with refinement of class name.

Application of the word. The application of a word to more objects, in more contexts, in more times, and from more points of view was examined for further indication of growth in word meaning. The groups' and individuals' responses suggested trends of greater differentiation for words in four instances in Task 1. This trend was observed in only two instances out of a possible twelve in Tasks 2 and 3. Although there is insufficient evidence to substantiate the findings, it may be speculated that provision of experience encourages convergence on the stimulus as presented.

II. CONCLUSIONS OF THE STUDY

Within the limitations of the study, conclusions have been drawn regarding observed patterns of growth in word meaning and the apparent effects of two contextual settings on this growth for the Ss in this sample. These conclusions are stated in relation to the research questions posited.

Research Question 1

What are the common characteristics of the categories of word meaning and the means of expressing these

categories as revealed in the oral language of elementary school children at each of four age levels?

Certain common characteristics of categories of word meaning and the means of expressing these categories were identified at different age levels. Furthermore, patterns of growth in word meaning were observed across the age levels.

The six-year-old Ss named criterial properties for all stimuli with concrete referents, although some of the possible categories of meaning were not named. As the referents became more abstract, an increasing number of Ss did not respond. Their responses were generally of a concrete nature with single words often carrying a broad meaning. Occasionally, they resorted to demonstration to express meaning. In most instances, the six-year-old Ss were unable to identify multiple word meanings for the given stimulus.

The seven-year-old Ss identified additional categories of meaning and employed class names for some of the stimuli with concrete referents. Although they tended to reply in concrete terms, they began using qualifying phrases in run-on sentences as they searched for precise labels. In addition, they identified an increasing number of multiple word meanings and used more adverbs.

In some of their responses, the nine-year-old Ss used qualifying phrases in their attempts to express meaning for a word. At other times, they revealed an ability to use single words of precise meaning. The nine-

year-old Ss produced the greatest number of labels for criterial properties and the greatest number of categories of meaning than did any of the age groups in some of the instances where an experience was provided. There was a substantial increase in the number of word meanings identified by these Ss in comparison with the two younger groups.

The eleven-year-old Ss generally labelled the largest number of criterial properties and employed the greatest number of categories of meaning in response to verbal stimuli. They were able to give generalized labels for most of the stimuli, except for some of the stimuli with abstract referents. It appeared to be an age level of continuing refinement of labels, often in abstract terms. There was not substantial evidence to indicate an increased identification of multiple meanings or use of adverbs.

Research Question 2

> What differences in the characteristics of the categories of word meaning and the means of expressing these categories occur across the four age levels?

Growth in word meaning occurs from a younger age level to an older age level. This growth was revealed in an increasing number of (1) multiple meanings, (2) labels for criterial properties, and (3) different categories of meaning across the age levels.

Growth in quality of word meaning became apparent with Ss of the older age groups. This growth was revealed in refinement of labels for criterial properties and

critical attributes that define classes, with the responses of the Ss age nine and eleven being most precise. In general, the older Ss possessed a greater repertoire of expressions to convey an idea and applied the word more generally. Age nine was a significant year as a "sorting-out" period in expression of a concept.

Shifting beginning and end points of language growth patterns were influenced by the stimulus, the task, and the chronological age. Certain characteristics in the responses of the Ss age seven and nine revealed that this period seemed to be a time of testing a broad and sometimes imprecise range of words and expressions to convey meaning.

Research Question 3

What changes in categories of meaning emerge in response to:
a. verbal stimuli?
b. real and/or vicarious experiences?
c. visual representations?

Different results were produced by each of the given types of tasks. Therefore, in interpreting the Ss' responses in this study, it was impossible to report categories of word meaning without reference to the task in which they appeared--both the design of the task and the interpretation of it.

The Ss were asked to respond divergently to eighteen stimuli organized within three major tasks and to respond convergently to several questions. Strictly verbal tasks, compared with real and/or vicarious experiences and visual representations, tended to result

in the production of more criterial properties and categories of meaning with a gradual increase from ages six years to eleven years. When the verbal stimulus was combined with either an immediate experience or a picture, the pattern of gradual increase fluctuated so that the greatest number of properties and categories often occurred at age nine. Additional experience seemed to be a factor in an earlier accumulation of meaning.

There was some evidence to indicate that the nature of the task also tended to influence the quality of word meaning. The Ss generalized and applied a word more readily in response to verbal stimuli than to real and/or vicarious experiences and visual representations. In quality of word meaning, some nine-year-old Ss were assisted in generalization when they were provided with experiences or a picture. However, there was insufficient evidence to draw a conclusion about the influence of the task on the quality of meaning in general.

Research Question 4

> How are the changes in categories of meaning, arising from responses to varied and selected stimuli, revealed in children's oral language?

The nature of the stimulus seems to be a major determiner of a child's expression of word meaning. Comparing the Ss' responses to concrete stimuli and abstract stimuli within each of the tasks, the Ss produced a greater quantity of responses and ideas, both extending over a broader range of categories of meaning, for concrete

stimuli. The Ss responded to all stimuli representing concrete referents. As the referents became more abstract, some six-year-old Ss did not respond.

There was some evidence to suggest that quality of meaning also was affected by the stimulus. With the majority of the stimuli representing concrete referents, the beginning points of categories of meaning appeared at age six and were refined by age eleven. However, as the referents became more abstract and responses became more difficult, the beginning points of the categories began to appear at age seven and, in these instances, remained unrefined at age eleven.

It is therefore important to ensure a range of stimuli, representing the concrete to abstract continuum, to tap word meaning.

Research Question 5

> What effect does the adult-child setting have upon the child's oral expression of word meaning as compared with the adult-group setting?

The contextual setting, adult-child and adult-group, appeared to have little influence on the Ss' production of language in the present study (Task 1). The Ss, in general, produced more language (criterial properties and categories of meaning) in an adult-child setting than in an adult-group stiuation. The responses of the Ss indicated little difference between the influence of the two contexts

with respect to quality of word meaning.

Summary

For the responses of Ss in this study, consistent, overall patterns of growth in word meaning could not be identified without reference to the nature of the stimulus and the task, in addition to chronological age. Predictable patterns, with shifting beginning and end points, occurred within these constraints. The nature of the differences within the variables of stimulus, task, and chronological age was revealed in both quantity and quality of word meaning.

III. IMPLICATIONS FOR EDUCATION

Implications for education were identified in the conduct of the study and would appear to offer some direction for both prospective and experienced teachers.

Eliciting Ss' oral responses to a variety of tasks seemed to offer a potential means of investigating word meaning. The need for such a method was suggested by Smith, Goodman, and Meredith (1970):

> Teachers more than ever before need to listen to their children and observe their behavior from the point of view of thought and language development (p. 127).

Some insight into the commonality and variability of word meaning for a class of children could be attained by applying the techniques of this study to a random sample of individuals and to a group within a class.

Even though oral language appears to be valid for examining children's language, teachers are cautioned against hasty judgement on the basis of one mode. Nine-year-old Ss in this study at times appeared to be more capable of generalization than were the eleven-year-old Ss. For example, the hierarchical organization of the citrus fruit "orange" seemed to be more detailed and precise in the responses of the younger group. However, the lack of language in this particular sample does not always indicate the lack of word knowledge. Teachers are encouraged to judge a child's language facility on the basis of a representative sample of his responses. Other approaches may add to what is known about the child's knowledge of word meaning (e.g., pantomime; written language; responding in action to spoken commands).

Ss in the middle years, as a group and as individuals, represented a broad range of language development, depending on the nature of the task and their own experiences. It was a period of grappling with ideas as they shaped meaning. At times these Ss used fragments (e.g., "sort of") or an increasing use of adverbs. At other times they produced precise labels (e.g., "canter"; "turquoise"), or provided a sophisticated hierarchical organization (e.g., "mammal" and "member of the wolf family" at age seven). Recognition of the transition period, during which a child's language may at times appear to be awkward, is an important consideration for the classroom teacher.

The wide variation in facility of language expression suggests the importance of capitalizing on the critical teaching moment. Some of the Ss occasionally experienced difficulty in moving from the listing of criterial attributes for an abstract referent to the organization of a hierarchy. For example, at ages nine and eleven many attributes for "poverty" were given, but the Ss did not generalize it as a "state" or "condition." "Happiness," on the other hand, was classified as a "feeling" and stimuli with concrete referents were classified readily by many Ss ages seven and nine. When it appears that the child has knowledge of the attributes, instruction to help reach the next step in generalization would seem to be advisable.

Through questioning, the older Ss seemed to become aware of generalization as a strategy, and could use it to organize ideas. Thus learning could be incidental. For example, when the older Ss were asked,"What different things have you told me about (stimulus given)?" they often began by listing properties already stated. However, when the investigator responded with such statements as "Yes, that's the sound," or "M-hm, color," the older Ss usually picked up the general category given and organized subsequent properties into categories of meaning. The younger Ss generally continued with naming specifics. This observation suggested the need to help the child develop strategies for generalization at the opportune time.

Other findings also suggested the importance of the critical teaching moment. The Ss responded to all stimuli with concrete referents, but experienced more difficulty in responding as they moved to concrete-abstract and abstract referents. It would seem that provision of tasks at a child's level of cognitive development supplemented with some tasks based on more sophisticated levels of abstraction would be desirable.

Contrary to expectations at the beginning of this study, the pooled responses of the individuals contained a greater number of categories of meaning, criterial properties, and multiple word meaning than did the pooled responses of the groups. In the pilot study, the groups of older subjects, verbally and non-verbally, supported the comments of their peers and generally produced more categories of meanings and criterial properties than did the individuals. The mutual support of members of the group may have been an influential factor in the quantity of their language production. The interaction was not apparent in the groups of Ss in the major study. Although the findings are not definitive, it is suggested that teachers emphasize personal instruction, especially for young children, in addition to many group experiences. In this way, the benefits of both contexts could be utilized.

The findings of the study also offer some procedural implications which are worthy of consideration by researchers in the field of language. These implications

concern the nature of the task, the nature of the stimulus, and the situational contexts in which language is produced.

The Ss were presented with four major tasks--three designed to elicit divergent responses to verbal stimuli, real and/or vicarious experiences, and visual representations, and one designed to elicit convergent responses to specific questions and commands. The Ss' patterns of word meaning often varied according to the task given (e.g., production of generalized labels at an earlier age than eleven years when an experience was provided). The fourth task suggested characteristics of word meaning not revealed in the first three tasks (e.g., use of metaphor and simile in telling about the shape of a cutout). The production of language through presentation of the real object and through the representation of the experience proved to be a valuable means of expression. This provision of a range of experiences seemed important. Tasks designed for both divergent and convergent responses also appeared to enhance the Ss' opportunities to express their knowledge of word meaning.

Variations in the types of stimuli resulted in the production of different patterns of word meaning. This observation suggests the importance of selecting varied stimuli organized according to a child's present level of cognitive knowledge, in addition to providing challenges in the upper levels of cognitive growth. The researcher also might add further variations in the complexity of the stimuli to afford the opportunity for tapping the child's depth of

word knowledge.

Provision of two contexts for gathering the Ss' responses in the study, adult-child and adult-group, did not result in overall differences in word meaning within age groups. Nevertheless, further investigation concerning the influence of both formal and informal situational contexts in eliciting children's language responses should be considered. These contexts might include, for example, children's responses to a stimulus in a story period setting, the informal language of a birthday party, in addition to the two contexts employed in this study.

IV. SUGGESTIONS FOR FURTHER RESEARCH

1. The approach used in this study seems to offer a valid way of examining children's word meaning. A similar type of study should be done to refine the instruments used and to find additional information regarding children's knowledge and expression of word meaning.

2. Certain variables were controlled in the study: chronological age, intelligence rating, location of residence, years in school. An additional body of research on word meaning could be built by altering any of these variables as follows:

a. Include younger (e.g., kindergarten) and older Ss (e.g., grade 7).

b. Select a sample from inner city, rural, or town locations.

c. Extend the study to include Ss who measure

above or below average on intelligence scales.

3. The oral mode represents only one aspect of language usage. A parallel study could be conducted to examine the commonality and variability of children's word meaning as expressed in their written language.

4. Further evidence regarding a S's language competence might be gathered first by administering a more detailed instrument composed of direct questions and commands related to the categories of meaning, and then by supplementing the replies with tasks requiring open-ended responses.

5. A study might involve an in-depth examination centred on one task for Ss from a variety of intelligence ratings, in different classroom climates, and within a variety of social contexts. For example, what does pollution mean to Ss of varying intelligence, in different classrooms located in inner city, suburban and rural areas?

6. According to Menyuk (1973, p. 176), evidence is lacking regarding the common properties existing between lexical items used by children and these same items used in dictionaries. Such evidence could help determine what modifications in dictionaries would be necessary to meet children's developmental needs in word meaning.

7. Could a S profit from direct instruction designed to make him more aware of the breadth and depth of word meaning? The question could be examined through the presentation of relevant teaching units which are preceded and

followed by instrumentation of the type used in this study. An alternative would be to make comparison with a control group not receiving treatment.

8. Knowing a S's total range of meaning for a word is important. Knowing whether he can select appropriate meaning for a specific purpose is another important area for investigation. A beginning was made in Siemens' study (1973) when she determined a child's range of word meaning and whether he could focus on a particular descriptive task. Research should be done to expand the current evidence regarding children's selections of meanings for specific purposes.

V. CONCLUDING STATEMENT

In conclusion, the oral responses of the Ss suggested that it may be possible to predict patterns of growth in word meaning as observed from an analysis of the oral responses of children at different age levels. The nature of the task, the nature of the stimulus, and the chronological age of the S all appeared to contribute to the differences in the quantity and the quality of word meaning elicited from the Ss in the study. In addition, the study showed that both divergent and convergent responses in the oral mode afforded a useful source of some part of the Ss' word knowledge.

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APPENDICES

DENTAL
DENTAL EDUCATION

APPENDIX A

THE RESEARCH INSTRUMENT

INSTRUCTIONS TO THE INTERVIEWER

The research instrument is composed of four sections, each section consisting of a different type of task.

Task I: Verbal stimuli

Task II: Real and/or vicarious experiences

Task III: Visual representations

Task IV: Extension questions

Each of Tasks I, II and III contains six stimuli to which the child responds orally. Task IV is composed of several questions to which the child again responds orally. All responses should be recorded on audio-tape.

Begin with Task I, followed by Tasks II, III and IV. Within each task, order the stimuli as indicated by the guiding arrows. Provide relaxation periods at least every forty-five minutes; more often if the child appears to be restless or reluctant to respond. No time limit should be imposed on any child's response.

In Tasks I, II and III of the instrument, instructions to the interviewer appear within parentheses; instructions to the student outside parentheses. Task IV is self-explanatory.

INSTRUCTIONS TO THE STUDENT

Introductory Statement

I am anxious to find out more things about children's language by listening to what you have to say to me. I would like to find out how much you can tell me about different words and things. Everything you say will be taped by this taperecorder. There is no time limit so speak as long as you wish.

Specific Instructions

First, let's practise with one. Here is a pencil. Pick it up. Look at it carefully. Now, tell me everything you can about pencils. Pretend that I don't know anything about pencils and each thing you tell me will help make it clear to me. (If the child does not respond, add the instruction which follows.) Pretend that I'm from another planet and I haven't even heard about pencils. (The interviewer should not give any clues as to what might be said about the word. Encouragement may be given through such expressions as "m-h-m," "good," and by nodding the head or smiling.)

Now, let's review what you have told me. What different things have you told me about pencils? (Allow ample time for full response. Add things which the child has omitted.)

Is there anything else you can tell me about pencils? Is there any other way the word pencils can be

used, completely different from what you have talked about?

Task I: Oral verbal stimuli. (Using the foregoing instructions, present each of the following stimuli in the following order:

table → pollution → anniversary

horse ← illness → holiday

Follow the specific instructions for each task.)

Task II: Real and/or vicarious experiences. (The following stimuli are presented in Task II:

ruler → game → happiness

orange ← song → nervousness

Use the same lead, support, and review statements as outlined in Specific Instructions except for the additions prior to the leading statement as given.)

Stimulus: ruler

This time we are going to do something a little different from before. Here is a ruler. Feel it . . . Smell it . . . Strike it on the table . . . Look at it carefully. Tell me everything you can about rulers.

Stimulus: game

Let's play a game called Home. (Give instructions. Play the game. Any child's game would be suitable.) Now, tell me everything you can about games.

Stimulus: happiness

Tell me about a time you felt happy. (Allow

time for response.) What made you feel happy? (Allow time for response.) What is happiness? Tell me all you can about <u>happiness</u>.

Stimulus: orange

Here is an orange. Smell it . . . Feel it . . . Look at it carefully . . . Taste a bit of it . . . Tell me everything you can about <u>oranges</u>.

Stimulus: song

This time I am going to play a song for you on the taperecorder. Sing or clap along with it if you wish. (Play <u>Join in the Game</u> by the Limeliters.) Tell me everything you can about <u>songs</u>.

Stimulus: nervousness

Tell me about a time you felt nervous. (Allow time for response.) What made you feel nervous? (Allow time for response.) What is nervousness? Tell me all you can about <u>nervousness</u>.

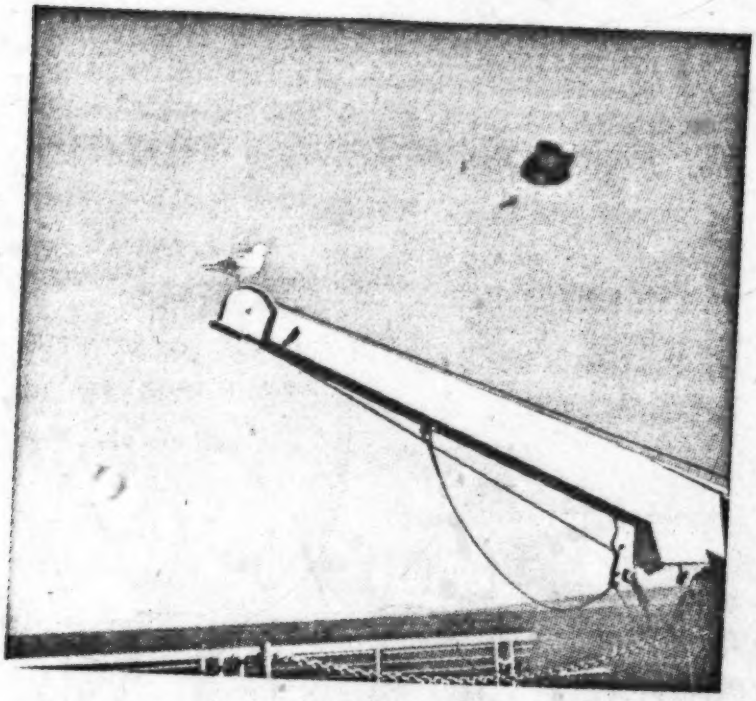
<u>Task III: Visual representations</u>. (The following stimuli are presented in Task III:

seagull → prize → education

dog → job → poverty

The first and second tasks, "seagulls" and "prizes," are introduced through slides and a mounted collection, respectively. The remaining four are introduced through pictures. Pictures of the stimuli in Task III are presented in Plates 1-6. For each task use the following statement.) Here is a picture of _____(s). Look at it

very carefully. Tell me everything you can about _____(s). (Then continue with the procedure as outlined in Specific Instructions.)



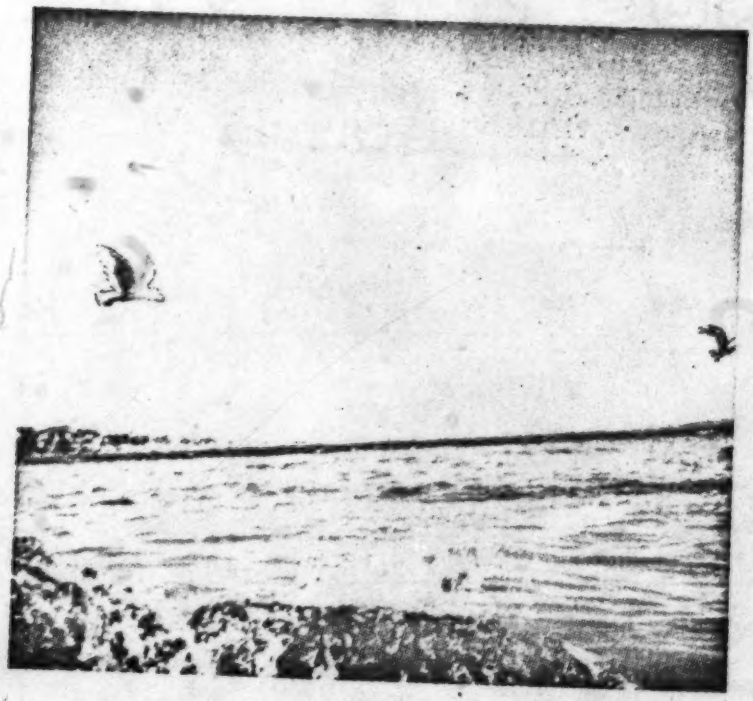


Plate 1 Seagulls

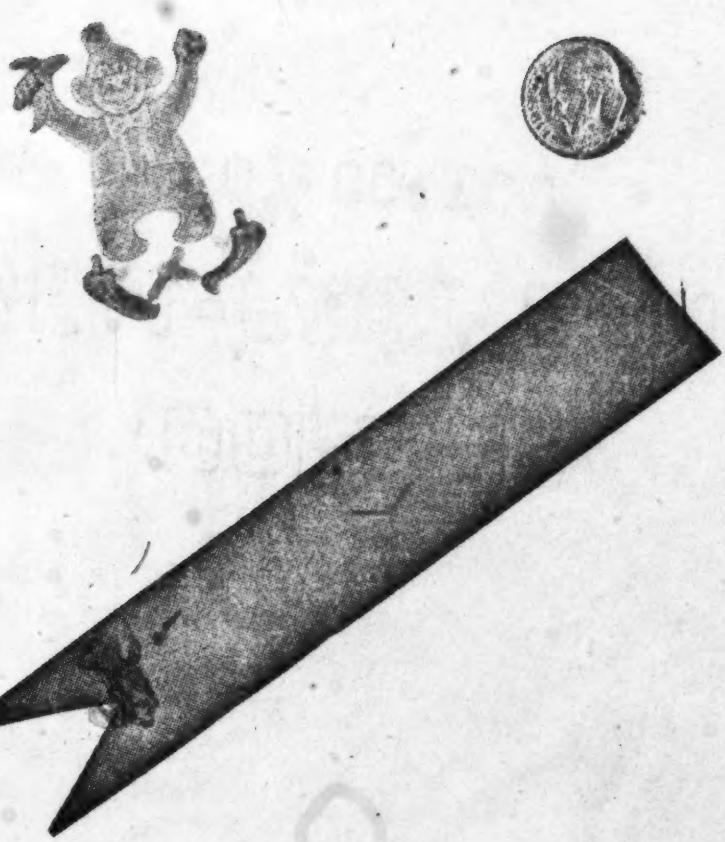


Plate 2 Prizes

Plate 3 Education

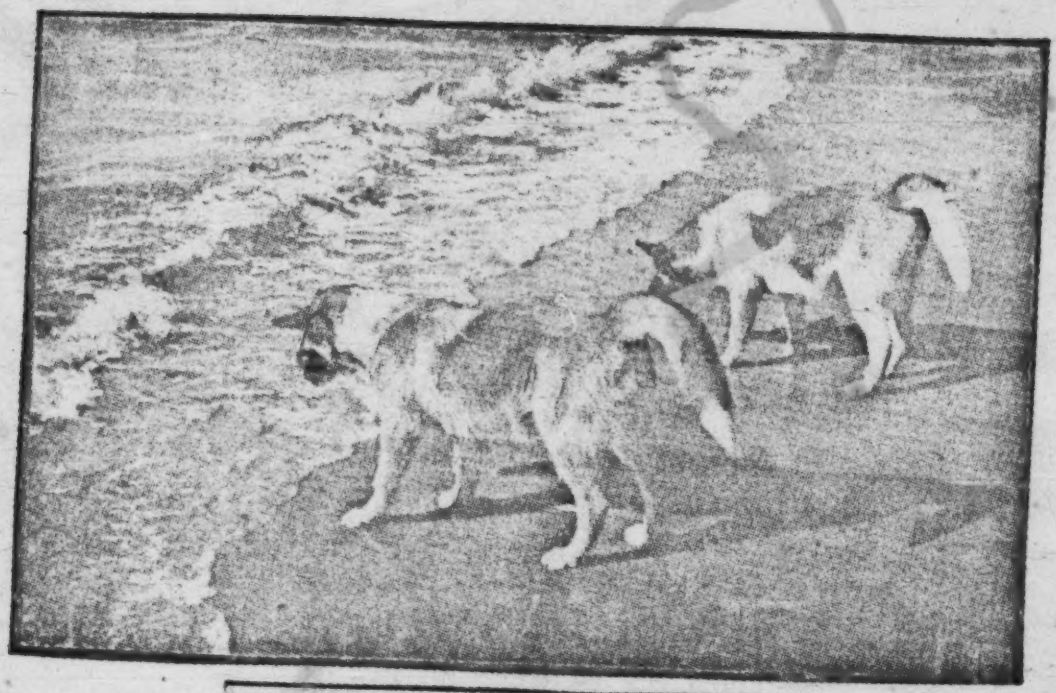
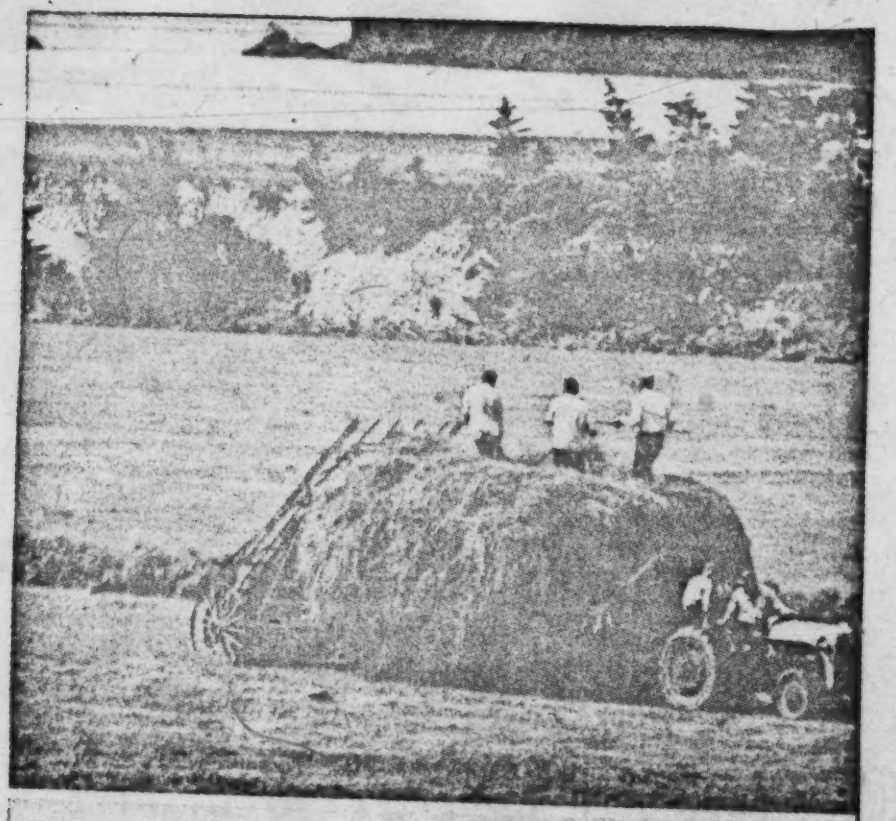


Plate 4 Dogs



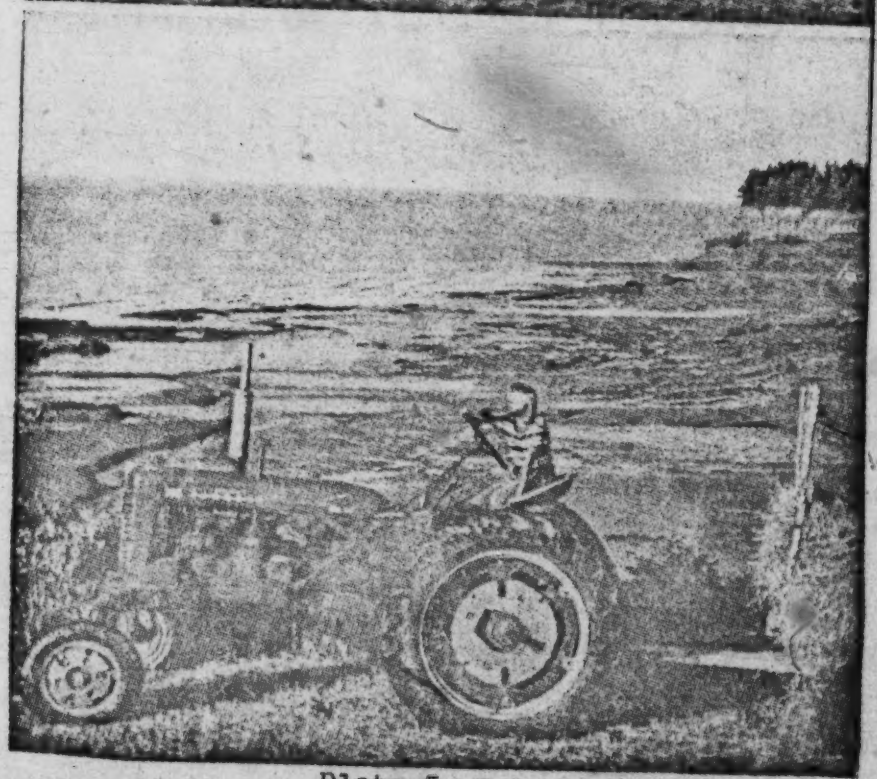


Plate 5 Jobs

Plate 6 Poverty

Task IV: Extension questions. Columns I and III provide information for the interviewer; namely, the categories of meaning in which information is sought and the stimuli employed for this purpose. Column II states the questions to be presented to the subjects.

CATEGORIES	QUESTIONS	STIMULI
1. Color	a. What color is this square?	a. avocado paint sample
	b. and this one?	b. turquoise paint sample
2. Shape	a. What shape is this figure?	a. oval cut-out
	b. and this one?	b. pear-shaped cut-out
3. Size	What size is an elephant?	picture of an elephant
4. Texture	Feel all of these pieces of paper.	
	a. How does this one feel to your fingers?	a. slick magazine paper
	b. this one?	b. art construction paper
	c. and this one?	c. sandpaper
5. Weight	a. What can you tell me about your weight?	verbal
	b. about the weight of a feather?	verbal
	c. about the weight of a school bus?	verbal

CATEGORIES	QUESTIONS	STIMULI
6. Taste	Here are some different kinds of fruit that I will ask you to taste.	
	a. Tell me about the taste of this one;	a. frozen strawberries
	b. this one;	b. lemon
	c. and this one.	c. apple
7. Smell	Smell this bar of soap. Tell me about the smell of soap.	bar of Irish Spring soap
8. Sound	a. Tell me about the sounds of chickens.	a. verbal
	b. Tell me about the sounds of cars when they are first started.	b. verbal
9. Actions	Tell me about the different ways that a cat can move from one spot to another.	verbal
10. Qualities	a. What is it that you like about a dog?	a. verbal
	b. What is it that you like least, or do not like, about a dog?	b. verbal
11. Use	Tell me all the different ways a tree could be used.	verbal
12. Part-whole	Here is a picture of something you have in your home or have seen somewhere else. What different parts can you name on it?	Picture of a color TV set with a football player on the screen
13. Where located	Name all the places where you could find a bicycle.	verbal

CATEGORIES	QUESTIONS	STIMULI
14. Class names and others of the same class	a. Tell me some ways in which oranges, grapefruits, and lemons are all alike.	a. verbal
	b. Tell me some ways in which dogs, horses and cows are all alike.	b. verbal
15. Connotation	a. How do dogs make you feel?	a. verbal
	b. What do you think of snowballs?	b. verbal
16. Synonym	a. Give a word that means much the same as "tree."	a. verbal
	b. Give a word that means much the same as "jump."	b. verbal
17. Antonym	a. Here are two pictures. This child is happy but this one is _____.	a. two pictures of children's faces; one happy and the other sad
	b. This piece of paper is clean but this one is _____.	b. a clean piece of white paper and a piece of paper with dirty footprints on it

APPENDIX B

THE PILOT STUDY

PILOT STUDY

The pilot study was conducted by the investigator in one elementary school in a town adjacent to the city of Edmonton.

I. PURPOSES

The main purposes of the pilot study were:

1. to determine the availability of Ss (subjects) following the application of the variables of years in school, chronological age, intelligence rating, ecology of the classroom, type of language user, rural or urban residence, and background experience;

2. to examine intelligence ratings relative to availability of Ss' scores, tests used, and dates of testing;

3. to develop and test an instrument for selecting Ss with similar background experiences;

4. to assess the suitability of a number of tasks for the four different age levels proposed for the study;

5. to test the introductory, support, and review procedures used in the administration of the tasks; and

6. to refine the criteria for the analysis of the Ss' responses to the tasks.

II. AVAILABILITY OF SUBJECTS

Table B.1 indicates the total enrolment for Years (Grades) 1, 2, 4 and 6 and the number of Ss who qualified for the pilot study following the application of the variables. Ss for Years 4 and 6 were located in a total of four classrooms (two classrooms for each year); for Years 1 and 2 in a total of six classrooms (three classrooms for each year). To acquire at least ten Ss in Years 4 and 6, it was necessary to extend the range of intelligence ratings from 100-115 to 98-117. Consequently,

TABLE B.1

STATEMENT OF ENROLMENT AND NUMBER QUALIFIED

Year	Enrolment	Number Qualified
6	58	10
4	60	10
2	76	13
1	77	23

the same range, 98-117, was employed at all levels. All Ss who qualified in Years 4 and 6 were used in the pilot study. In Years 1 and 2, ten Ss from each year were selected randomly in Year 1 and by random elimination of three Ss in Year 2.

The research plan required sixteen Ss at each level, eight to respond individually and eight to respond

in groups of four each. Consequently, the sample from which to draw Ss for the major study was extended to three elementary schools and six classrooms or more at each age level. With the greater number of available Ss from which to draw the sample, it was possible to maintain intelligence ratings in the middle range of 100-115, inclusive.

III. INTELLIGENCE RATINGS

Intelligence ratings were available in the school records for each of the Ss in the pilot study. However, an examination of the records in the schools for the major study indicated no available scores for Year 1. The existing scores in Years 2, 4, and 6 had been acquired nine to eighteen months previously. Furthermore, the scores were based on different national norms; Canadian norms at the senior level and American norms at the junior level.

The foregoing factors led the investigator to check the existing scores by administering Canadian adaptations of the Cognitive Abilities Test and the Lorge-Thorndike Intelligence Tests originally constructed by Thorndike, Hogen and Lorge and later adapted for Canadian use by Wright. The scores revealed a discrepancy of as high as sixteen points between the scores on the school records and the scores acquired by the investigator. Consequently, all Ss with chronological

ages falling within the ranges of 6 years - 6 years 6 months, 7 years - 7 years 6 months, 9 years - 9 years 6 months and 11 years - 11 years 6 months were tested by the investigator in the major study.

IV. EXPERIENCE FACTOR

An instrument was designed for the purpose of working toward a sample with common experiences. All proposed stimuli were listed and hidden among an equal number of other stimuli. The S was instructed to check how much experience he felt he had with each of the stimuli. He could check None, Hardly Any, Some (Average), Quite a Bit or A Great Deal (Lots) for each item. The language arts teacher and a parent of each S were asked to complete duplicate forms regarding the child's experiences. The investigator planned to discard from the sample any S who was checked None by all three respondents (i.e., S, teacher, and parent).

A comparison of the Ss' responses to the stimuli with the decisions on the questionnaires showed that the instrument was not an accurate indication of the Ss' experiences. In responding to some stimuli, all three respondents scored Some or more experience on a particular item but the S could not respond orally. For other stimuli, all three scored Hardly Any or None but the S responded ably.

The proposed instrument, designed to collect

information on background experience, was deleted from the main study. No response may be an indication of a child's language facility in response to a task. Furthermore, some of the respondents tended to overestimate or underestimate a S's ability to respond to tasks. It was hoped that selection of Ss who had attended school the same number of years and lived in a comparable type of setting would help equalize the range of experiences. In addition, the suitability of all tasks proposed for the major study was determined by presenting them to the Ss in the pilot study.

V. SUITABILITY OF STIMULI

Twenty-four nouns and twenty-one verbs commonly used with these nouns (e.g., "sing" with "song") were developed as tasks and used in the pilot study. They were organized on a concrete to abstract continuum within three methods of eliciting responses (i.e., verbal stimuli, real and/or vicarious experiences, and visual representations).

The main purpose in presenting these stimuli as tasks was to determine whether Ss at the four age levels could respond to them. The investigator arbitrarily assigned a response level from one third or more of the Ss as a suitable level of acceptance for the nouns. Consequently, two items, "bravery" and "production," were discarded. Eighteen of the remaining twenty-two stimuli

were selected to represent an increasing degree of difficulty as indicated in the Ss' responses. For example, "anniversary" elicited 100% response from eleven-year-olds but 50% response from six-year-olds. Concrete tasks such as "horse," "ruler," and "seagull" elicited 100% response from all age levels.

Since verbs would be accounted for as "action of" or "action upon," specific reference to verbs was eliminated from the study.

Stimuli selected for the major study are listed in Table B.2.

TABLE B.2

SUMMARY OF STIMULI SELECTED FOR MAJOR STUDY

Method of Eliciting Responses	Selected Stimuli for the Tasks		
VERBAL STIMULI	table	pollution	anniversary
	horse	illness	holiday
REAL AND/OR VICARIOUS EXPERIENCES	ruler	game	happiness
	orange	song	nervousness
VISUAL REPRESENTATIONS	seagull	prize	education
	dog	job	poverty

A second purpose for giving the tasks was to determine the Ss' attitudes towards the given tasks. Informal conversations with a sample of the Ss and the Ss' teachers indicated positive reactions. The teachers

stated that the children were always eager to return for further interviews. Ss at the various age levels replied with such remarks as : "Too short"; "Fun"; "Can we come again"; "I liked all the words."

VI. CLARITY OF INTRODUCTORY, SUPPORT AND REVIEW PROCEDURES

At the beginning of each interview, the investigator explained the purpose of the interview and how the S's responses would become part of the total study. Each task was introduced with the following statement:

> Tell me everything you can about (stimulus stated). Pretend that I don't know anything about _____ and each thing you tell me will make it clear to me.

If the S was reluctant to begin, an additional statement was given as follows:

> Pretend that I'm from another planet and I haven't even heard about _____.

In general, these statements encouraged the Ss either to begin production or to state they could not respond. Some Ss were reluctant to begin responding to the initial task. Consequently, the investigator clarified the nature of the task by beginning with "pencil," an item not included for the major data.

Support statements such as "m-h-m," "very good," "I hadn't thought of that" appeared to encourage the Ss to continue responding to the stimulus.

A statement was formulated to provide an opportunity for the S to review his response and add further

points which he may have overlooked inadvertently. The statement was as follows:

> Now let's review what you have told me. What different things have you told me about _____?

The investigator added major points omitted by the S and then stated:

> Is there anything else you can tell me about _____?

The decision was to retain the review statement for the major study.

VII. TESTING AND REFINEMENT OF CRITERIA FOR ANALYSIS OF CHILDREN'S RESPONSES

The investigator analyzed responses to the oral verbal stimuli for all Ss, ages six, seven, nine and eleven years, according to the following categories:

1. For quantity of meaning:

Increasing number of criterial properties observed and labelled:

Color	Qualities
Shape	Use/Function
Size	Part-Whole
Texture	Where located
Weight	Class names and others of the same class
Taste	Connotation
Smell	Variety of contexts in which known
Sound	
Actions	

- (McFetridge, 1973)

2. For quality of meaning:

a. Increasing refinement in labels for any criterial property

b. Increasing repertoire of expressions available to express ideas

c. Increasing refinement of critical attributes that define classes

d. Increasing application of word to more objects, in more contexts, in more times, from more points of view.

(McFetridge, 1973)

The proposed method generated responses in all categories with the exception of "weight" and "taste." Information in these categories was acquired through a series of extension questions. A search for additional categories, not included in the hypotheses, resulted in the following revisions and/or additions:

1. Subdivision of "actions" into "action of" and "action upon" (e.g., relative to the stimulus "horse").

2. Addition of the category "cause" (e.g., relative to the task "pollution").

In addition, an analysis of the responses indicated that this method provided information regarding the five hypotheses on the quality of meaning.

Specific examples for each of the hypotheses are included in the report on the validation of criteria for analysis of data.

APPENDIX C

THE VALIDATION INSTRUMENT

VALIDATION OF CRITERIA FOR ANALYSIS OF ORAL RESPONSES

To explore the characteristics of word meaning at first, second, fourth and sixth years in school, children's responses to various tasks can be examined according to selected criteria:

1. Increasing number of criterial properties observed and labelled.
2. Increasing refinement in labels for any criterial property.
3. Increasing repertoire of expressions available to express ideas.
4. Increasing refinement of the critical attributes that define classes.
5. Increasing application of the word to more objects, in more contexts, in more times, from more points of view.

(McFetridge, 1973)

The validation instrument is divided into three major parts. Various categories of meaning located in the literature and exemplified in the pilot study are given in Section A. Ways in which word meaning may be refined are outlined in Section B. Examples from the pilot study are provided. Questions geared to elicit criterial properties which may not have appeared in the original responses are given in Section C.

SECTION A

Instructions to the judges. You are provided with the following sets of materials:

1. sample data from a group of children in their sixth year at school responding to the stimulus "horse";
2. sample data from a group of children in their first year at school responding to the stimulus "horse"; and
3. a chart of categories of meaning applicable to all stimuli presented in the study.

The categories of meaning listed on the chart are numbered 1 to 18, inclusive. Responses in the data are numbered accordingly; for example, "they're animals" is designated as "class name," number 16. Circled items indicate that their assignment is doubtful.

In column A under each age group, an asterisk indicates that this category of meaning was used at least once by the subjects. Sample data have been selected from children ages six years and eleven years. However, the plan is to apply these categories of meaning to all tasks used in the major study. The frequency of different categories of meaning is determined with this procedure.

INCREASING NUMBER OF CRITERIAL PROPERTIES OBSERVED AND LABELLED

CATEGORIES OF MEANING	Age Groups			
	6 years - 6 years 6 months		11 years - 11 years 6 months	
	A	B	A	B
1. Color	*		*	
2. Shape	*		*	
3. Size			*	
4. Texture			*	
5. Weight				
6. Taste			*	
7. Smell				
8. Sound			*	
9. Action of	*		*	
10. Action upon			*	
11. Qualities			*	
12. Use	*		*	
13. Part - Whole	*		*	
14. Where located	*		*	
15. Cause				
16. Class names and others of the same class	*		*	
17. Connotation				
18. Variety of contexts in which known			*	

WRITTEN PROTOCOLS

HORSES (Grade 6 - Group)

(This time I want you to tell me all you can about horses.) They're strong.[11] They're animals.[16] Some in different colors,[1] sizes,[3] shapes.[2] (Okay, name some colors, sizes and shapes.) Brown.[1] A horse can't be white to begin with you gotta start off with a darker color. Black.[1] He's not full grown when he's born, he's gotta grow. Keep 'em on farms.[14] They need lots of room to roam[9] around in. Scientists say that ancient[18] horses were only 2 inches tall or maybe higher. They go into races[12] sometimes. Most racing[12] horses are thoroughbreds.[16] (Okay.) They're kept on farms.[14] Ponies[16] are little;[3] some are Shetland[16] ponies. Colts[16] are small.[3] People now are using 'em for meat.[12] They stay in stables.[14] People put their tails[13] different ways, like braid[10] 'em, or or tie[10] 'em up. The Queen, King, Prince Anne and Philip not Prince Philip but Mark Phillip he, um, they, um, got together because of horses, and he won a gold medal in a horse race. Some of their foods are oats, barley. (Very good.) Water, drink water, alfalfa and they usually keep warm if it's not they're fur[13] they usually keep warm in straw. When you ride them, you usually use a saddle. Some of them become well-known because of their jumping[9] and racing,[9] like Secretariat. Horses are popular[18] in the world.[18] Spaniards brought them from Spain to North America. They are a smart animal. They know lots of things other animals don't know. But they're not as

smart as pigs, that's true. (Carry on.) They can do tricks, open gates and shut gates and stuff like that. Some of them know what to do in case of danger ya know if someone falls in a pit or sumpin they go and get help. And, um, in the earlier days they used to run around in bands and they were used to fight the war. When they're wild stallions fight for the leadership of a group of animals, horses. When they fight they don't just fight for a while they fight till the end most of the time . . . unless another horse backs out. If you kick the horse too hard he'll buck. (Good point.) One of his, ah, one of his defences are kicking and biting. If you touch his flanks he sorta kicks up. They're used in different kinds of shows, rodeos and he eats sugar. Some more of their foods are apples and sugar lumps. They get rewarded like for apples and that if they do something good that their owner likes. They're sort of a treat, sugar and apples are sort of a treat. They don't have skin like us they have hide. (Okay, good point.) They got hair on their hide too. They're faster than humans some of 'em. (Would you like to go on about that?) Like what. (You said they are faster than humans.) Well like they can take faster pace and that. They got more muscles in the legs. And they can take a farther leap than a person can. (Okay.) Their skin, their skin under the hair, is a lot tougher than human. Not very many of 'em are deformed like a kind of like don't have anything wrong

with their brain like humans. There isn't many wild herds of horses right now. The colts usually hang around with their mothers for about a couple of years. (Okay.) At first they used horses for dog meat and cat meat. They're mammals. There's a lot of talk about 'em in the United States that if they should be used for food or not. They say that their meat is sweeter and more tender. The horse will, sorta like, obey you if you don't beat 'em. Donkey's a relative of a horse. (Good.) Zebra's are except they're more wild. Horses were very helpful to man. Some of 'em are, too, and the settlers in the earlier days. In this prehistoric age they could climb trees. They used to pull carts and, um, ah, covered wagons in the olden days and men ride them around the range and stuff like that. (Right.) And, um, in ancient places, maybe Egypt and Greek, they used 'em for chariot races. (Very good.) Pulling chariots. They used 'em for pulling sleds like when you have sled rides. (Right.) Long time ago they used to pull hay things, hay wagons. Some of them are used in circus like other animals ride on them or people ride on them and they're used for entertainment. People use 'em for experimental use. In the new College in Edmonton, I'm not sure which one it is they use, they have a horse; they take a horse right into the classroom and they study it and go for rides. There's lotsa songs and shows about horses, like Home, Home on the Range. (Yes, yes.) They say eventually that, ah, that a horse's

relative was, ah, . . . (Maybe you'll think of it. Now let's just review the different things that you've told me about horses. What did you talk about?) Used for entertainment, sizes, shapes and colors, appearance (size? We didn't go very much into detail on size, we just mentioned the word size and just mentioned the word shape.) The horses aren't as tall[3] as you anyhow. (Yes, this came with my question, what things did we talk about?) About their skin, what it's like. Appearance. (Okay. What else did you talk about?) What they did and what their ancestors were like. Uses for men. (Uses for men.) Who brought 'em eventually. (Background, the history.) They're used for entertainment. (That's uses.) How um, what they did for people, like how they brought people together. (Okay, now is there anything else then that you can, by not repeating any of those points but are there any other points that you can . . . .) The Queen has a stable, um, she has lotsa horses. In the earlier war the Germans used 'em a lot to fight. (That's uses again though, isn't it?) They say that the unicorn if there was one, the unicorn[16] is supposed to be related to horses. The horses in like ancient times like they had to be fast to get away from the dinosaurs. Some didn't even get away. Their faces are fairly long. (Good point.) They got four[13] legs. They got a tail; a mane[13], at the end of their face they got a nose[13], soft[4] and velvety[4]. It's usually a darkish[1] color around the eyes[13]. They're brown eyes,

most of 'em. (What else can you tell me about colors of horses?) Brown, white, sort[1] of greyish, black. They got hooves[13], like horse shoes. They're made of metal and, um, kind of grow like fingernails. They can't feel it when you pound[10] the nail into their hoof. And, uh, anyways the ends of their hooves are cut[10] off sometimes. They have to get their hooves um cut down or else it will hurt their feet. Horses have to look real nicely groomed or they like being[10] groomed and they have to be[10] groomed for horse shows. (Okay.) In town[18] they have to wear horseshoes. They make a different kind of a sound then any other animal makes. Sort of like[8] a hee-hee-hee . . . , like they're laughing. (What did you say?) A neigh.[8] (Very good.) Something like they're laughing.[8] (Sounds something like they're laughing. I never thought of that.) They have pointy[2] ears.[13] When ya hit[10] 'em with a stick like when you get mad at 'em they holler,[8] they sorta scream[8] out. They don't have as much fur on top as they do under the chest, not as thick anyhow. A certain time of year they start[9] shedding. (Very good.) Their tails are different hair than their backs, it's long[2] and stringy,[4] same as their mane. Some horses <u>manes</u> are real[3] long and some are real short.[3] (Yes, that's right.) Some of them get their tails cut not cut but the hair cut. (Well you've come up with quite a few more points now since you've reviewed, haven't you, and some very good points too.) They like being[11] groomed. They're clean[11] animals. (Okay,

I think that you've done very very well on that one.)

HORSES (Grade 1 - Group)

(This time boys and girls I want you to tell me everything that you can about horses.) Um they live (Thomas) they live on farms.[14] (Very good.) . . . They, they eat[9] hay and they eat[9] little thi- little stuff and they and also they live in fields.[14] (Good.) You can ride[12] on them. (Right.) They eat[9] grass. (Very good.) You can, they eat water. (Very good.) They live with the cows[14] and chickens and some piglets sometimes. (I beg your pardon.) They live with, they live with (Ronnie this way please, okay.) (They live with,) Cows and piglets and chickens sometimes. (Okay, very good. What else can you tell me about horses?) (Remember you're making it, you're telling me about horses so I'll know what horses are.) . . . They sleep[9] in barns[14] (Good.) Some, some sleep[9] on the grass.[14] (Very good.) . . . and they get baby horses[16] they, they have to get some from their mom. (Okay.) They sleep on grass. (Very good.) (Tell me.) They live in a barn. (Very good.) . . . They live in the farm. (Live on a farm.) . . . (You knew quite a bit about horses didn't you?) Get a horseback when you saddle with the, with the saddle and um, you can go hunting[12] with them. (Good.) . . . You can go on a trip[12] with them. (Hm m.) You can go to the country[12] with them. (Can go where?) To the country. (Very good.) You can go in town[12] and ride them and also you can go to, also you could go to Tuscon Junction if you don't, if you don't. (You can go where?) If you don't have a car you could

take your horse. (Okay.) I saw, I saw a horse in, in town he and, um, a man, he had to, he went to look at you're, you're not supposed to ride them in Leduc. (Hm m.) Um, you can race with a horse. (Yes, good point.) Race them uh racing barrel horse (racing barrel horse.) Yeh cause my did gots a horse and he, and our horse might get to go in the racing barrel if he knows how. (Hm m.) (Catherine) You can win a race with a horse. (Hm m.) . . . Help play act out if you having a race horse, you have to have long[2] neck[13] so they stretch out. (Hm m.) . . . (Now what different things have you told me about horses?) (What different things have you told me about horses?) (You talked about what?) All kinds of stuff. (All kinds of stuff, okay, what kinds of stuff have you told me.) . . . (You've told me about what, what you can do with them. You told me, you told me where I could find them. You told me what they eat. What else can you tell me about them? You told me about the babies.) . . . Uh (Are there any kinds of horses that aren't the horse that we're talking about?) Uh Uh (Can you name some?) A Redbred horse, a racing[16] horse. Uh a plain[16] old horse. (Plain old horse, okay.) Colt.[16] (Colt.) Um. (Can you tell me something about the colors of horses?) Brown[1] horses. (Brown.) White[1] (White) White and black.[1] (White and black.) Black. (Okay.) Just[1] white. (Just white.) Some brown, his fur[13] down their back[13] and all the rest brown and some more black. (Okay, now I'm going to ask you

something else. Can you tell me how a horse moves from one place to another?) . . . Legs.[13] (Legs.) Walks.[9] (He walks.) Horseback (Hm m.) . . . sort of running[9] when a man's riding him. (hm m.) (Okay, so you've done very, very well there too.)

Questions:

1. DO you agree with the investigator's decision in each case? If so, mark a check mark (✓) in column B to indicate agreement. If not, mark an (X) in column B to indicate disagreement.
2. Certain words and word fragments have been circled on the original data sheets. These circled items may be termed "doubtful"; that is, it is doubtful as to which category of meaning numbers they should receive. In your judgement, what category of meaning should be designated in each case? Answer by numbering according to the selected category of meaning in blue or red color on the original data sheets.
3. In your judgement, have any categories of meaning been omitted for these data?
   Check (✓) the appropriate reply.

   Yes _____ No _____

   If "yes," state the categories of meaning which you think should be added.

   _____

   _____

   _____

4. In your judgement, should any of the stated categories of meaning be omitted?
   (In addition to "horses," consider other tasks from the study which will be included; for example, "illness," "pollution.")

Questions: (Continued)

Check (✓) the appropriate reply.

Yes _____ No _____

If "yes," state the categories of meaning which you think should be omitted.

_____

_____

_____

SECTION B

Instructions to the judges. Additional hypotheses and supporting examples from the pilot study are listed below. After each of the following charts, indicate whether you agree or disagree with the investigator's decision by placing a check mark (✓) after the appropriate response in the space provided.

INCREASING REFINEMENT IN LABELS
FOR ANY CRITERIAL PROPERTY

STIMULUS	AGE GROUPS			
	6 yr.-6 yr.6 mo.	7 yr.-7 yr.6 mo.	9 yr.-9 yr.6 mo.	11 yr.-11 yr.6 mo.
horses (color)	brown; black	brown; black	sort of a reddish color; sort of a reddish brown	brown; black; sort of greyish
horses (action of)	walks; sort of running when a man's riding them	run; trot	running; galloping; trotting; walking	run; racing; galloping; trot; canter

Agree _____ Disagree _____

INCREASING REPERTOIRE OF EXPRESSIONS

STIMULUS	AGE GROUPS			
	6 yr.-6 yr. 6mo.	7 yr.-7 yr. 6mo.	9 yr.-9 yr. 6 mo.	11 yr.-11 yr. 6 mo.
Tables (shape)	- - - - - - - -	Some are triangles, circles, squares.	They're shaped very different shapes - like round and square	Different shapes; some of them are round and some are square . . . hexagon kind of shaped.

Agree _____ Disagree _____

• INCREASING REFINEMENT OF THE CRITICAL ATTRIBUTES THAT DEFINE CLASSES •

STIMULUS	AGE GROUPS			
	6 yr.-6 yr. 6 mo.	7 yr.-7 yr. 6mo.	9 yr.-9 yr. 6 mo.	11 yr.-11 yr. 6mo.
Horses	baby horses; colt; eat hay and grass	colts; hair running down the neck (no mention of breeds or relatives)	nice animals; shaggy tails; can brush them; colts (plus relatives of the horse)	animals; mammals; covered with fur and hide; colts (plus many breeds and relatives of the horse; e.g., donkey)
Anniversary	- - - - - -	wedding	party	like a birthday for weddings; remembering; celebrate it each year

Agree _____ Disagree _____

INCREASING APPLICATION OF WORD TO MORE OBJECTS
IN MORE CONTEXTS, IN MORE TIMES,
FROM MORE POINTS OF VIEW

STIMULUS	AGE GROUPS			
	6 yr.-6 yr. 6mo.	7 yr.-7 yr. 6mo.	9 yr.-9 yr. 6mo.	11 yr.-11 yr. 6 mo.
Pollution	(Pollution in their immediate environment.)	(Pollution in the present; air pollution)	(Pollution in the present; from motors and factories; water and air pollution; pollution in Edmonton)	(Pollution in the past, present and future; noise, land, air and water pollution; city and country; in Japan; in Leduc.)
Illness	(Personal; referring mainly to a car accident.)	(Personal; contagious disease of young children)	(Mainly personal illnesses in the present; minimal reference to illnesses in general)	(Illnesses in the present and in the past; of people in general; in hospitals; contagious and non-contagious

Agree _____ Disagree _____

SECTION C

Instructions to the judges. The following questions are designed to extend the findings regarding quantity and quality of criterial properties. Check (✓) whether you agree or disagree with the questions for the various categories.

CATEGORY OF MEANING	QUESTION	AGREE	DISAGREE
Color	What color are these squares? (avocado and turquoise samples)	____	____
Shape	What shape are these figures? (oblong and pear-shaped figures)	____	____
Size	What size in an elephant? (picture of an elephant)	____	____
Texture	How do these pieces of paper feel to your fingers when you touch them? (samples of slick paper, construction paper and sandpaper)	____	____
Weight	What can you tell me about your weight? About the weight of a feather? About the weight of a school Bus?	____	____
Taste	Here are some different kinds of fruits, I would like you to taste. Tell me about the taste of this one (strawberries); this one (lemon); this one (apple).	____	____

CATEGORY OF MEANING	QUESTION	AGREE	DISAGREE
Smell	Smell this bar of soap. Tell me about the smell of soap. (a bar of Irish Spring soap)	____	____
Sound	Tell me about the sounds of chickens. (verbal) Tell me about the sounds of cars when they are first started.	____	____
Action	Tell me about the different ways a cat can move from one spot to another. (verbal)	____	____
Qualities	What is it that you like best about a dog? (verbal) What is it that you like least, or do not like, about a dog?	____	____
Use	Tell me all the different ways a tree could be used.	____	____
Part-Whole	Here is a picture of something you have in your home or have seen somewhere else. What different parts can you name on it? (Picture of a color T.V. set.)	____	____
Where located	Name all the places where you could find a bicycle.	____	____
Class names and others of the same class	Tell me some ways in which oranges, grapefruits and lemons are all alike. Tell me some ways in which dogs, horses and cows are all alike.	____	____
Connotation	How do dogs make you feel? What do you think of snowballs?	____	____

CATEGORY OF MEANING	QUESTION	AGREE	DISAGREE
Synonym	Give a word that means much the same as "tree." Give a word that means much the same as "jump."	____	____
Antonym	Here are two pictures. This child is happy, but this child is (sad). (pictures of a happy child and a sad child)		
	This piece of paper is clean, but this one is (dirty). (a clean piece of paper and a dirty piece of paper)	____	____

APPENDIX D

Ss' RESPONSES TO QUESTION 14, TASK 4

TABLE D.1

INDIVIDUAL RESPONSES TO THE QUESTION: TELL ME SOME WAYS IN WHICH ORANGES, GRAPEFRUITS, AND LEMONS ARE ALL ALIKE

Chronological Age in Years	Subject	Response
6 yr. - 6 yr. 6 mo.	1	Oh, they taste good. Oranges taste good . . . I just like the orange
	2	Cause, uh, they grow and they have some vitamin and they grow and grow till they're big. You pull 'em out and they must have the same juice, but they don't have the same juice in 'em 'cause, uh, you water 'em. That's why. You plant them and then you water 'em.
	3	They're circles.
	4	Some of them are orange and some of them are yellow and some of them are real bright and that.
	5	They're round like a ball. They're round like a wheel or a scoop or a bicycle.
	6	On the outside, they're all the same kind. They're all the same kind color on the outside.
	7	Um, they're all round, and they all have juice.
	8	They don't taste the same. Oranges are lemons. Have peeling on them.
7 yr. - 7 yr. 6 mo.	1	Sweet . . . round. They taste just alike. They sort of taste the same.

TABLE D.1 (continued)

Chronological Age in Years	Subject	Response
7 yr. - 7 yr. 6 mo. (continued)	2	They're all sour, sort of. They're all round. You can cut them. . . . can throw them up in the air.
	3	They're all round.
	4	They're vegetables.
	5	They grow on trees. They're a fruit and all come from B.C. and they all have vitamin C in them.
	6	They're fruit.
	7	They're fruit.
	8	They have a taste. They're juicy. They're colors, and they're good. You can eat them.
9 yr. - 9 yr. 6 mo.	1	All sour and sweet. You can find them on trees. You can grow seeds from them.
	2	Sour. Some of them are. They're all fruits.
	3	They're citrus fruits.
	4	M-m, you have to peel 'em . . . you have to cut 'em. Taste sort of bitter.
	5	They all have an outside. They all grow on trees. They're all fruits.
	6	Well, round. I think they all grow on trees and they sort of taste the same in a way.
	7	Well, orange, it's round. Yeh, they can be all round and a lemon is just the same only it's sour, and it's got a yellow. They can be like squishy. They can be really juicy. They could be round or oval.

TABLE D.1 (continued)

Chronological Age in Years	Subject	Response
9 yr. - 9 yr. 6 mo. (continued)	8	They're all sour at times, and they all grow on trees.
11 yr. - 11 yr. 6 mo.	1	Well, they're fruit.
	2	They all grow in the same . . . they all grow on trees and . . . .
	3	They all have a peeling. They all have seeds inside. They all have their smells and they have a different taste. They're juicy. They, um, I think they all grow on trees. They can be cut the same way.
	4	They're all citrus fruits.
	5	They're, ah, um-m-m, they're all, they're round and, ah, um-m, they grow on trees, and ah, um-m . . . um-m, they all have juice in them, sorta and . . . .
	6	They're all round. They all grow on trees. They're all fruit and they're all good for you.
	7	They're all kind of sweet. They're all round. They're all fruit.
	8	They grow on trees.

TABLE D.2

INDIVIDUAL RESPONSES TO THE QUESTION: TELL ME SOME WAYS IN WHICH DOGS, HORSES, AND COWS ARE ALL ALIKE

Chronological Age in Years	Subject	Response
6 yr. - 6 yr. 6 mo.	1	They all give milk . . . um, they weigh a lot of pounds.
	2	They eat grass and they have milk and water and they eat, uh, food and they . . . eat grass most of the time.
	3	They all have the same shape of body.
	4	Some of them, like a horse looks like a dog and a dog looks like a horse, and cats look like, um, looks like sort of like a pig. Um, they all look the same, sort of.
	5	'Cause dogs and horses and cows have feet.
	6	They mostly are loud all the time.
	7	They both have, they all have a sound.
	8	They all have legs, four legs.
7 yr. - 7 yr. 6 mo.	1	They all run. They have babies. Because they all stay in pastures.
	2	They all have four legs. They all have a tail. They all have big teeth.
	3	They're animals.
	4	They have four feet. You can use them for pets.
	5	They all have four legs. They all have ears and they all have mouths and tails and some and, they're all on the farm.
	6	They're animals.
	7	They're animals.

TABLE D.2 (continued)

Chronological Age in Years	Subject	Response
7 yr. - 7 yr. 6 mo. (continued)	8	They're animals.
9 yr. - 9 yr. 6 mo.	1	They're skin and meat, and you can, and they're all animals.
	2	They're all animals. They all have four legs. What were they all? They all produce something--babies.
	3	They're mammals.
	4	Hm-m, they can be different colors. Uh, they're all over the stables.
	5	They all have four legs and tails and they all have ears. They all have eyes.
	6	They sort of have the same features. You can train a horse to jump over something. You can train a dog to do that. Dogs and cows and horses are look about the same. Like they can all sit or lay or run. Cows are pretty lazy though and they're all mammals.
	7	They all have four legs. They all have fur and they all have pretty big noses.
	8	Um, they all can live on a farm, and they all need water to live.
11 yr. - 11 yr. 6 mo.	1	They're animals.
	2	They all have four feet. They all have a tail and they all sort of have a long nose. Both have two eyes. Both have two ears.
	3	They all have fur. They all eat, drink, and sleep. They all, um, they all have tails. They all have feet and eyes, we missed that. They all have babies. They all need shelter of some sort.

TABLE D.2 (continued)

Chronological Age in Years	Subject	Responses
11 yr. - 11 yr. 6 mo. (continued)	4	They're all animals.
	5	They, ah, um-m . . . they're all animals.
	6	They have four legs and they, most of them live on a farm, and they're playful. A cow is, in a way, if you want to play with them. And they're useful.
	7	They're all animals.
	8	Uh, they all stand on four feet. You find them all on farms, and they're all useful.